J. F. 52.

Urania Cœli motus scrutatur & Astra.

The *explanation* of the *Frontiſpiece.*

WHoe'r e thou art that doeſt deſire to know
What thoſe are that thus act in a dumb ſhew,
This Page *ſhall be the* Prologue *to deſcry*
Th' intentions of this ſilent Comedie.
Firſt, to diſcloſe the Scæne, *'tis fit we ſhould,*
The Curtain of darke Ignorance unfold,
This, for a long time did our Language keepe,
Fetter'd *in a* Long-waking-walking-ſleepe,
Untill our Authors *rouſing*, open threw
The Curtain, *and bid* Ignorance *adew:*
But not content to ſee themſelves, *ſo long*
As We *were blinded by an unknown Tongue,*
They' ave made this Sun of knowledge to ariſe
In our Horizon, *ſeen by Engliſh eyes*;
Yet not ſo perfectly, *but there* remains
Some Terra incognita *for after-pains,*
Although in all their Courſe they' ave ſailed by
Thoſe Sea-marks *of* rev'rend Antiquity,
And gone beyond them too, *a Pigmies ſight*
(Above a Giant) goes beyond his height.
Now view the fair URANIA, *and ſee*
How Shee's ſupported by Geometry,
And quick Arithmetick, *whoſe onely part,*
Is as the A B C *to this curious* Art,
Whoſe hands contain, and offer to the eye
Thoſe Globes of Science, *which unfolded lye*
Within the Book. Turn over then and ſee,
And learn by that Practique Aſtronomy.

T. F.

J. T. 52.

Vrania Cœli motus scrutatur & Astra.

Urania Practica

URANIA PRACTICA:
OR,
PRACTICAL ASTRONOMIE:
In VI Parts,

Containing,

I. An explanation of the Vulgar Notes used every Year, with the order how to finde them for ever, in the *Julian* and *Gregorian* Accompts, both Arithmetically, and by new invented Tables.

II. An *Ephemeris* for 19 years, beginning *Anno* 1648, and ending *Anno* 1667: With Astronomical Rules and Tables, to calculate the Places, Aspects, and Eclipses of the Luminaries for any time past or to come, with exact Types of all the Eclipses both Solar and Lunar, that will be visible in *England* these 19 years. Also excellent Rules to finde the Rising, Culminating, and Setting of the Moon, not heretofore published.

III. An Astrologicall Treatise, shewing how to erect a Figure, to judge of the effects of Eclipses, and to finde the time when, and the places where, their effects will be most predominant.

IV. The Doctrine of the Sphear or Globe.

V. An abreviate of Geographie, representing the surface of the World, and the Provinces thereof, with their Longitude and Latitude, Scituation and Distance, one from another.

VI. Diverse Astronomicall Tables of the Altitude, Azimuth, Amplitude, Rising, Culminating, Setting, and Declination, of the Sun and fixed Stars, in severall Latitudes, by Trigonometricall calculation: With the proportions by which the said Tables were calculated.

Unto which is added (for the benefit of Sea-men) diverse Rules and Tables, of extraordinary use in

NAVIGATION.

All which Rules, Tables, and Calculations, have been compared with the best approved Authors and Observations, and made more compendious then any hitherto published

Nothing of this nature being extant in the English Tongue.

Calculated for the Meridian of *London*.

By VINCENT WING, and WILL. LEYBOURN,
Practitioners in the Mathematicks.

LONDON,
Printed by *R. Leybourn*, in *Monks-well* street neer Cripplegate, 1649.

Uranium Practica:

OR

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In VI. Parts,

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To the HONOURABLE Sir JAMES HARRINGTON *Knight; one of the Members of the* Honourable House of Commons.

SIR;

ALL eyes are upon you, as one of the most eminent fixed Stars within our *Horizon*, for your Light and Influence hath beene very perspicuous in the most Darke and Malignant Times: Our experience of these, & also of your singular Judgement in the *Mathematicks*, encourages us to Dedicate this Book to You; conceiving Him most fit to be *Protector* of the *Arts* & *Sciences*, by His Wisdome, Whose Jndge-

ment and Dexterity of Apprehenſion is beſt able to diſcerne *Truth* from *Falſhood:* It's probable this our *Firſt-borne* may be catcht by the heel in its *production*, or cenſured before it be heard ſpeake for it ſelfe, for ſo hath it fared of late with men of far greater *knowledge* then our ſelves, from divers meer *Pretenders* to this *Science:* Yet, Sir, if this ſmall *Piece* ſhall gain your candid *Approbation* and *Shelter*, and this our *boldneſſe* your *Pardon*, you ſhall both *heighten* our *contempt* at ſuch barkers againſt the *Moon*, and exceedingly cheriſh our *future endeavours*. That God that hath led you by the hand through many *dangers*, ſtill protect you and your Noble Family.

So prayes,
Sir, Your moſt humble Servants,
V. WING, W. LEYBOURN.

To the impartiall READER.

Friendly Reader,

NO *Icarian* ſoaring, nor lucre to our ſelves; but our meer good will to thoſe that long after theſe Arts, hath principally induced us to divulge the ſuccee ding Tractate; which labour we ſhould not have undertaken in theſe our tender years, when ſo many pregnant Wits are now at work, had not even neceſſity it ſelfe required it: And although *of making many Books there is no end*, as the Wiſeman ſpeaks, *Eccleſ.* 12.12. yet notwithſtanding, even at this preſent, we may complain of paucity and dearth of Books of this nature, for, to our knowledge, there is not any one yet extant in the Engliſh Tongue, that delivers any accurate Rules and Tables Aſtronomicall, to compute the true motions and paſſions of the two great Luminaries; as for thoſe ſet down in the *Shepherds Kalender*, *Generall Prognoſtication*, *Computation*, and the like, to finde the Lunations and Aſpects between the Sun and Moon, how uncertain and erroneous they are, we leave to the cenſure of the judicious: But for your better ſatisfaction we have inſerted ſuch Rules, Tables, and Calculations, as agree beſt with truth, and afford moſt brevity and perſpicuity: not omitting to inſert the moſt uſefull of thoſe Rules vulgarly delivered, in reſpect they may pleaſure thoſe who are not Mathematically diſciplin'd, and the ingenious *Tyro* may (by the exact calculations herein inſerted) ſee the errors of the one, and the verity of the other.

To which purpoſe, we have exactly compoſed an Ephemeris, ſhewing amongſt others, the Conjunctions, Oppoſitions, and Eclipſes of the Luminaries, till the year 1667. calculated for the Meridian of *London*, according to the Obſervations of *Tycho Brahe*, *Lansberg*, *Argol*, and other excellent Uranoſcopers. To which we have added, New, Accurate, and moſt Eaſie Tables, by us deviſed, to compute their true motions for ever, with a ſuccinct methodicall Doctrine of calculating the Eclipſes of the Sun and Moon for any Scituation, with

more facility then ever yet extant in any Language, and with as much certainty as can be expected, as the moſt accurate Obſervations of this preſent age apparently demonſtrate.

In the other parts of our Book, for the Generall good of all men, we have Mathematically treated of thoſe things we eſteemed moſt proper for the Worke, moſt meet for the Volumne, and moſt requiſite for the Student to know and practice; as diverſe Rules and Tables Aſtrologicall, to erect a Figure, to judge of the effects of Eclipſes, the time when, and the places where, their effects will be moſt predominant. Alſo we have Coſmographically (with as much perſpicuity as brevity) delivered the Doctrine of the Sphere or Globe, exemplarily deſcribing all the Circles therein imagined, with their ſeverall uſes: And Geographically repreſented the ſurface of the Earth, and the particular places thereof, with their ſcituation and diſtance, Longitude and Latitude, difference of Meridians, &c. To omit many things of excellent uſe (as the deſcription of the Year, the diverſity of Seaſons and Shadows, the length of Days and Nights, &c.) we have ſet down all the moſt uſefull Propoſitions in Aſtronomy, whereby to finde the *Declination*, *Right Aſcenſion*, *Altitude*, *Azimuth*, and *Amplitude* of the Sun, and to that end we have calculated new Tables, and delivered the way how to calculate the ſaid Tables *Trigonometrically*, following therein the Analogie and Proportion laid down by *Ptolomie* and *Copernicus*, and for the eaſe of the Student, we have framed all our operations by the admirable Canon of Logarithmes compiled by that famous Mathematician Mr. *Hen. Brigs*, omitting, for the moſt part, the Tables of naturall Sines and Tangents, to the intent our preſent Work may be better underſtood, yea even by the unlearned, who were never trained up in the Studies of theſe Arts before, inſomuch that we dare boldly affirm, they may hereby (with admiration) in very ſhort time come to the knowledge of thoſe things, which learned men formerly have ſpent much time and labour to finde out.

But perhaps ſome may here ſay, what uſe and benefit may accrue by the ſtudy and practice of *Aſtronomie*? To which we anſwer: firſt, that the excellency and worth thereof appeares by the Subject of which it treateth, which is not of meane matters, but of the ſecret and hidden myſteries of the Heaven above, for (as *Ariſtotle* ſaith) *Eam ſcientiam eſſe præſtantiorem, nobiliorem, quæ vel circa res præſtantiores verſatur, vel quæ certior eſt.* For beyond all humane Sciences, this commends unto us the goodneſſe, wiſdome, and omnipotencie of God, inſomuch that the Kingly Prophet ſaith, *Pſal.* 19. 1. *The Heavens declare the glory of God, and the Firmament ſheweth his handy worke.* Alluding to what he had formerly ſaid,

Pſal.

Pſal. 8. 3, 4. *when I conſider the Heavens the works of thy fingers, the Moone and the Stars which thou haſt ordained, what is man that thou art ſo mindfull of him?* And *Platoe's* opinion is, that our Eyes were principally given us for this uſe and end, to be occupied in the contemplation of the Heavens, as may alſo appeare by *Ovid, lib.* 1. *Metamorphoſ. verſ.* 85. *& ſeq.*

Os homini ſublime dedit, cœlumq; videre
Juſſit, & erectos ad ſydera tollere vultus.

To which purpoſe in another place he alludes, when he thus ſings.

Fœlices animæ, quibus hæc cognoſcere primum,
Inq; domos ſuperas ſcandere cura fuit.

Surely then the practice of *Aſtronomy* is both good, laudable, and pleaſant, and fitting for men to make ſearch and ſcrutiny in; and verily, if a worke that is *Bonum, utile, & jucundum*, both good, profitable, and pleaſant, doe deſerve your favour, *Hic labor, hoc opus eſt*, this is it. Beſides the neceſſitie of it is exceeding great, as *Phyſicians, Poets, Hiſtorians, Coſmographers*, and *Mariners*, can beſt teſtifie, who can tell you, 'its moſt neceſſary for them, and innumerable others, to know and practice: inſomuch that *Ptolomie* in the beginning of his *Almageſt*, would have *Aſtronomie* ſimply amongſt the other Sciences, to be the chiefe, and he gives the reaſon of it, *Cap.* 1. *Dict.* 1. *Hæc enim ſcientia* (ſaith he there) *non parum valet ad reliquarum comprehenſionem, & præcipuè ſcientiæ Dei excelſi; ipſa namque & ſcientia, & via ad ſciendum Deum altiſſimum.* Alſo the antiquity of it is as great, as the Science is commendable, for it was practiſed in the old World, before the Floud, as may appeare by that excellent Hiſtoriographer *Joſephus, Lib.* 1. *Cap.* 3. *de Antiquit. Jud.* Where he relateth that the Sonnes of *Seth* invented the Science of the Cœleſtiall Bodies, and to the end, their Inventions ſhould not be defaced out of the memories of their Succeſſors, neither periſh before they were perfectly knowne; They made two *Pillars*, the one of * *Braſſe*, the other of *Brick*, and in each of them did ingrave the principles of *Aſtronomie*, that in caſe the World ſhould periſh, either by fire, or water, (as they had underſtood by their Father *Seth*, who received the prædiction thereof from *Adam*) that then the one of the ſaid Pillars ſhould remaine, and expreſſe unto men, that which was therin imprinted for their inſtructions, that thereby the moſt noble Science of *Aſtronomie* ſhould not periſh.

* *The Engliſh Tranſlation reads it, the one of* Stone, *the other of* Brick.

And Divine *Du Bartus* ſeemes to imply the ſame, when he ſings.

Phalec *and* Heber, *as they wandred, fand*
A huge high Pillar, *which upright did ſtand,*

And

And afterwards, another nigh as great.
But not so strong, so stately, nor so neat;
For on the Flowry field it lay all flat,
Built but of Brick, of rustic Tiles, and Slate:
whereas the first was builded faire and strong,
Of Jasper smooth, and Marble lasting long.

Also *Josephus* testifies in the same Booke, that *Abraham* (a just and a great man, expert in Coelestiall things) first instructed the *Aegyptians* in *Arithmetique*, and in the science of the Starres, who afterwards proved most admirable and excellent *Proficients* therein, yea in such esteeme was it in those dayes, that none were created *Bishops* or *Priests*, but those who excell'd others in these Arts, whom they called by the name of *Mathematici*; amongst the *Lacedæmonians*, none did so familiarly associate with their Kings, as the *Mathematici*; and among the *Persians* none did accustome to salute their Kings, but the *Mathematici*; yea, *Aristotle* (the Prince of *Philosophers*,) reporteth, it was thus written to *Alexander* the great, *O Rex clementissime, nec surgas, nec sedeas, nec cibum sumas, aut potum, penitusq; nihil sine periti Mathematici consilio, si fieri potest, facias.* And no wonder, is it that *Astonomie*, and the *Mathematiques* were in such renowne and esteeme in those times, when for their excellency they were fit, chiefly for men of *Heroick* wits, and noble dispositions, and therefore was practised by Kings, Emperours, and noble Personages, as by *Ptolomie*, *Albuquase*, *Octavius*, *Augustus*, *Theodosius*, (one of the best Emperours) *Frederick* the second, amongst the rest by *Julius Cæsar*, who was sufficiently instructed in this kinde of learning as he speaketh of himselfe in *Lucan*,

——*Media, inter prælia semper*
Stellarum, cœliq; plagis, superisq; vacavi.

After whom followed *Adrian* the Emperour, who was so well versed in the motions of the Stars, that he annually wrot *Prognostications*.

What shall we say of *Alphonsus* King of *Arragon*? who was so excellent well learned therein, that he composed that famous worke of Astronomicall Tables, for which his name will never out.

Not to passe by that Renowned Emperour *Charles* the fifth, and *Ferdinando* his brother who tooke much pleasure in these studies, in making Astronomicall Instruments, and in searching out the motions of the stars: In imitation of whom succeeded *Philip* King of *Spain*, *Maximilianus* the Emperour, *Philibertus* Duke of *Sabaudia*, *William Landgrave* of *Hassia*, the illustrious *Nepeir* Baron of *Marchiston* in *S.* and Noble *Tycho Brahe* Lord of *Knudstrop* (that famous Restaurator of Astronomy) with many other magnanimous Princes and noble persons in all ages.

Ha-

Having briefly collected ſome of the moſt eminent Proficients in this admirable Science of Aſtronomy, we muſt not omit to mention what curious pieces (for the advancement thereof) have been compoſed, as Inſtruments appertaining to Aſtronomicall practices, and preſents for the greateſt Monarchs to embrace: Witneſſe the Heaven of ſilver ſent by *Ferdinando* the Emperour, to *Solyman* the Great Turk, in which the Planets kept their motions, the Sun and Stars riſing and ſetting, the Moone culminating at her due time, and the Eclipſes agreeing with thoſe in the Heavens. This Inſtrument (as is reported by *P. Jovius* and *Sabellicus*,) was brought to *Solyman* by twelve men, and the maker thereof being preſent, he tooke it in pieces, and ſet it together again in the preſence of the Grand Seignior. Nor muſt we forget the Heaven of glaſſe, which was triumphed over by *Saper* the Perſian King, who ſitting in his Chair of State, made this his Footſtoole, proudly ſtyling himſelfe brother to the Sun and Moon, and partner with the Stars: And therefore in his Epiſtle to *Conſtantine* the Emperour, he makes this his *Proœmium: Rex regum, particeps Syderum, frater Solis, & Lunæ, &c.*

We could cite many more, but theſe are Teſtimonies ſufficient, to ſhew that as wiſe and worthy men as ever were in the World, have made very great account of this Study amongſt others, and travailed exceedingly therein themſelves; and no marvell (as the learned *Nepper* ſpeaketh) ſeeing there is no kinde of Learning that more excites and ſtirs up noble and ingenious wits to excellent and eminent affairs, & contrariwiſe, that more dejects and keeps down ſottiſh and dull mindes then the Mathematicks, and therefore is it that ignorant men ſo invoigh and cavill at them, as enemies to their ſtupidity and ignorance, whereby the old Proverb is verified, *Scientia non habet inimicum niſi ignorantem* And they that rail at theſe moſt excellent Arts, what doe they but moſt notoriouſly manifeſt their groſſe ignorance, having eyes without ſight, onely led by nature, and *nature without learning* (ſayth *Plutarch*) *is blinde.* But we will onely adde this interrogation concerning the worth of this moſt excellent learning: *Quid enim jucundius eſſe poteſt, quid amenius, quid ſuavius, quid denique delectabilius, quam illam tot & tantorum luminum venuſtiſſimam atq; ordinatiſſimam ſeriem oculis perluſtrare?* Seeing therefore, it appears, the Art it ſelfe is exceeding good and pleaſant, and alſo profitable for a Common-weale, let it induce you to uſe, practice, and kindly to accept theſe our labours, which if we underſtand, you ſhall encourage us ſhortly to attempt greater matters; in the interim we commend this to your freindly cenſure, and reſt ready to doe you any ſervice we may.

V. Wing. W. Leybourn.

In praise of the Authors of this Work.

NOt *Tycho*, nor *Copernicus*,
Ne *Ptolomie* their Prince:
Maginus, *Lansberg*, *Alphonsus*,
Nor any other since.
That in so plain a path doth teach
URANIA to descry,
Her curious parts set forth to each,
Are here perspicuously.

V. W. *senior.*

Charissimo suo amico V. WING,
de opere utilissimo & multis laudibus efferendo.

DUm plebeia manet terræ radicitus hærens
Cura, colit pulchrum mens tua pulchra Polum:
Das animis lumen lippis, frontem, arte, micantem
URANIÆ *nudas, ut benè nota foret;*
Cùmque es cæleſti gènio, cæleſtia callens;
In Cælum nomen credo merere vehi.

EDVARDUS SIMMES.

O!
HOE
Come
SOME,
And SEE
WITH MEE,
HEAVENS puro
LITERATURE,
Begun to Bee
'Mongſt US ſet free,
By high mindes heaven *Ly-bourn*,
Cleer'd as the dawning Morn,
From foggie-Miſts, or Cloudes advance
Of ENVIE or of IGNORANCE,
Hovering over many an ENGLISH Pate
In TONGUES unknown to moſt, untill of late
Good *Will* free *Ly-bourn* up on th' *wing* of HOPE,
Broke through and cleer'd to us the Starry COPE,
They ſhew th' orders and powers of the ORBES above,
To raiſe our ſouls into the Love of great JEHOVE:
Whence intellectuall Light and Life, and all good gifts doe flow,
Hence away all Spight and Striſe, leave groveling here below:
Moſt up brave ſouls, mind things above, ſuch harmony maintain within
In Head, in Heart, in every Part, and ſo Immortall Glory winne

A PYRAMIS, *Erected and Dedicated to his Friends, the Authors.*

By Edw. Howſe, Διδάσκαλος.

To his much esteemed friends Mr. *V. W.* and *W. L.*

STand and admire, when thou do'st here behold
The Doctrine of the Spheare *to be unfold*
(By these my Friends) *the* Cause, *and the* Effects
Of an Eclipse, *and also the* Aspects
The Luminaries *make from day to day,*
With Right Ascensions, Azimuths, et cærera
That's in this Book; *for here 'tis made so plain*
That weakest men may hereby somwhat gain.
Here's no Eclipsing *of that glorious* Light
Which hath appear'd by others to our sight,
For these dispell all Clouds *that may arise,*
And seeme to fixe on the Beholders eyes;
Therefore the Worth, Fame, Merit, *of you* Both,
To Blazon forth I will not, I am loth
To undertake, least medling I should mar,
And cause a Cloud *to passe on your* Bright Star:
Goe *on and* Prosper, *let this* Work *refin'd*
Though passing forward, still remain behind.

JOHN WALKER, *Philomat.*

To his Ingenious friend W. L. *on his Generall* ALMANACK.

NOw babling *Momus*, cease thy vain correption,
See here's a *Gen'rall Rule* without *Exception*;
This Book like *Janus* bears a *double face*
Of *Past* and *Future*, both with equall grace,
Here it confutes the common *Saw*, that *When*
Time's past it cannot be recall'd agen:
Then doth it *antedate* the *Backward Yeare*,
And cause *before it's Time*, *Time to appear*;
In each so perfect that I may it call
Of all our ALMANACKS their GENERALL:
Proceed then friend, and thinke it not too late
To publish *that shall neere be out of date.*

THO. FORDE.

To his Friends, the Authors.

WILL-I-AM much affected at thy skill,
When Art lay LEY, *thou didſt manure and till*
It, with ſuch husbandry that after times
Shall reap the Grain of theſe thy Furrowed Lines.
Which whilſt 'tis Harrow'd with thy Partners pain,
Doth yield to both an equall Crop of Gain;
And while 'tis hid in ſpeculation, may
By this thy practice Crown URANIA.
For when I ſaw the figure of thy Book,
For a Cœleſtiall Figure *I it took;*
And finding ſuch promittors did direct
The Horoſcope, *and found the* Figure *deckt*
With fortunes, *but I durſt not judge*
Leaſt any Artiſt ſhould againſt it grudge;
Becauſe ſo few degrees *(of years)* Aſcend,
That 'tis not Radicall, *might ſome contend,*
But 'tis, for I dare ſay here's ſuch a Root,
To finde its Square *will put an* Artiſt *too't:*
Saturn *was well diſpos'd, that thus inclin'd*
Thee to be Grave with a Mercuriall *mind:*
Whoſe nimble WING *ſhall play the part of Fame,*
Flying from place to place to ſound your name;
You'r men in Art, *and yet me thinks I ſpie*
This great Conjunction *hapt in* Geminie,
Whoſe Influence *no* Oppoſition *ſhall*
Alter Your Dignities Eſſentiall.
If LEY *be* Barren, *and* BOURN *be a* Spring,
Thou haſt brought Plenty *from a* Barren *thing.*

Silvanus Morgan.

To his Mathematically, and otherwiſe ingenious friend, William Leybourn.

WHo would believe (that ſaw thy downy chin
Scarce Razor ripe) thou hadſt ſuch knowledge in
Th' *Ætheriall* Court, (credit me) but I know
There's ſtill ſome Miracles, my Judgement to
Would tell me I but dream'd: *Conjunctions, Trines,*
And *Oppoſitions, Aſpects, Tangents, Sines,*
The names are more confus'd and ſtrange to me,
Then Aps (Sanze number) in a Pedegree,
For there I have ſome knowledge. Truſt me (*Will*)
But that I know thee well I ſhould thinke ſtill
Thy yeares were more, for when I ſee thy Book,
Though thy own Manuſcript (but that I look
On thy ingenious ſoule) I ſtill ſhould be
In th' minde it were a Tranſcript, not from thee
It's Spring deriving: but I ſee thee fly
With thy *WING*'d partner through the *azure* Sky,
Where I muſt leave you like two Jewels ſet
As bright as *Sol*, ith' heavenly Cabinet.

Edw. Barwick, Philomuſ.

see* here
a sunne appeare,
CIRCLing with ARTsvTChest
ray, our regions shall create a day of
knowledge, routing all those severall mists
of ignorance, within whose darksome lists
as in a maze our captiv'd senses have
long sought in (vain this) doore to errours cave.
ThROugh Phœbus shine what eye CANnot disCERn
the path, hee's blinde indeed that cannot learn
by this the readiest way that leades unto
jove's starry court, which earst hee could not do,
EQUAll the royall eagles TOwRing flight,
not HOv'Ring In the fettering ZONe of night.
since, w'have this light, making discoveries
of what before wee held for mysteries
wherefore prepare, (these conquerors to adorn)
TROPhies of CAre and PRICe, and not with sCORN,
repay their pains by whom this birth was born.
and may these serve as *hesperus* to warn
the nighted world of this approaching morn,
which at the full meridian shall stand, scorning
a night, or envies blacker hand. bay
CIRCL's ANTiq: ARTIsts Crown
are due to these, as to those
of the gowne.

*This,
I presume,
maiden invention,
and if my THOughts
doe not too Much fAil me
the firSt our language hath
yet ever aFORDEd.

Be it consecrated to the memorie of
that peerless paire of ingenious
ARTISTS,
the AUTHORS
of the subsequent
ASTRONOMICALL Treatise,
V. W. and *W. L.*

Urania Practica,

To all and every man.

Reader me read attentively,
And in no wise disdain,
For I the secrets of the Skie
To all men here explain.
The curtain of blinde Ignorance
From Britains *I remove,*
New rules and Tables I commence,
Which I by Art approve.
As in a Glasse you here may see
The true course of the Lights,
Great secrets in Astronomy
Set out to all mens sights.
I teach the way to calculate
The Motions and Aspects
Of the two Luminaries great
Their Eclipses and Effects.
Let no man carpe at this that I
Doe shew by Computation,
The way how by Geographie
You may describe each Nation:
How that you may the Heavens mete
How each Star acts his part,
How they doe march, how they retreat
I here explain by Art.
Then censure not though Zoyle *dispraise,*
But take me as I stand,
For I resolve to cast my Rayes
To all parts of ENGLAND.

A Catalogue of Mathematicall AUTHORS.

Atlas, King of *Mauritania*
Anaximander
Ariſtarcus
Architas
Archimedes
Andromachus
Albumazar
Almeon
Albatagnius
Alfraganus
Alphonſus, King of *Spain*,
Appian
Blanchinus. Blagrave
Briggs
Callippus
Julius Cæſar
Cretenſis
Copernicus
Clavius
Cardaine
Chri. S. Longomontanus
Durret
Eudoxus
Euclid
Eichſtade
Erasmus Reinholdus
Foster
Gauricus
Gemma Friſius
Gallucius. Gunter.
Junctine
Kepler
Leovitius
Lansberge
Margarenſis Maurolicus
Meſſahalah
Merula
Maginus
Modronus
Nonius
Neipeir
Orontius
Oſwaldus. M^r. Palmer.
Purbachus
Pitiſcus
Regiomontanus
Ramus
Soſigenes. Stirrup. Serle.
Stoflerus
Theodoſius
Tycho
Vitellio
Ulacus

Courteous Reader,

HUmanum est errare, *Tis the fate of humain nature to erre, & it wil be humanity in thee to pardon these few* Errata's *of the Press, which in so great a pressure of erring Pamphlets, cannot be totally void of some mistakes: Which take thus corrected.*

PAg. 4. line 10 for to, read the. p. 8. l. 27. for 1648 r. 1649 p. 48. l. 8. for 16 2 22 r. 16 022. p. 51 l. 20 r. *Philosophos*, & l. 28 *scito*, & l. 30 *Albumasar* p. 53. l. 13 for left r. right, & l. *ult.* for lesse r. greater, p. 54 l. 19 for ♊ r. ♉ & l. *ult.* r. ♉ p. 65 l. 1. r. Moon p. 89 l. 14 for 16^{1} r. 16^{h} p. 95 l. 1 for C r. L p. 99 l. 6 r. 8 Chap. p. 103 l. 10 for *latitude* r. *altitude* & l. 21 r. Ch. 28 p. 104 l. 37 r. 28 Ch. p. 106 l. 2 r. Ch. 8. & l. 13 Ch. 30, & l. 28 r. *parallaxis latitudinis* p. 108 l. 36 r. Ch. 8, p. 110 l 14. for AC r. AG p. 111 l. 5 r. $0\,45'\,21''$ p. 125. l. 5 r. 6 ♌ p. 133 l. 30 for ☾ r. ☉ p. 145 l. 30 *dele* before mentioned p. 150 l. 11 r. *Funtline* p. 151 l. 18 r. *exercitus* p. 152 l. 13 r. *minitatur* p. 153 l. 1 r. *obitum* & l. 15 r. is p, 158 l. 24 r. murtherer p. 161 l. 35 r. dry weather p. 168 l. 2 r. *Alfraganus* p. 175 l. 14 r. which is, p. 177 l. 39 r. shee p, 198 l. 22 r. Dato p. 198 l. 25 r. *subsequenti.*

In the Ephemeris and Tables.

Pag. 15 col. 7 r. 9. 1-3 against Prime ☌ 2 r. 4 2 ♍ & against Pr. ☌ 18 r. 3 39 ♍ p. 17 Pr. ☌ 15 r. 9, 15 ♐ p. 19 Pr. ☌ 3 r. 5 27 ♍ p. 25 Pr. ☌ 14 r. 6 14 ♐ p. 29 Pr. ☌ 2 r. 9 0 ♐ p. 33 Pr. ☌ 16 r. 1 49 ♍ p. 35 Pr. ☌ 12 r. 8 6 ♐ p. 70 col. 6 l. 30 r. 5 3 p. 140 l. 14 col. 12 for 11 53 r. 15 53.

Practicall ASTRONOMY.

The first Part,

In which is conteined an explaination of the common Notes used every Yeare, together with the order how to finde them for ever; both in the Julian *and* Gregorian *Accompts: Also new invented Tables to finde the moveable Feasts and Terms; with divers cautions in the use of them, never yet extant.*

CHAP. I.

Of the GOLDEN NUMBER.

THe *Golden Number* is nothing but a Circle or revolution of 19 yeares, in which time the Ancients thought, that all the *Lunations* and *Aspects* between the Sunne and Moon, did returne to the same place they were at 19 yeares before; because, that in that space, the Dragons head made its Zodaicall revolution, but the experience of latter times hath found it otherwise; for, in 19 yeares there is an anticipation of an houre and a halfe; and likewise in regard of the many varieties and changes in the Moones motion, which causeth those ancient Rules to differ sometimes a day from the truth, and in processe of time will be very erroneous.

Now this Circle is called *Decem-novenalis Circulus*, whose severall parts are called the *Golden Number*, for, that it is, and hath been written in Red or Golden Letters in our Calenders, or else for the Golden use thereof: which is chiefely to find the Change, Full, and Quarters of the Moon: This Number Arithmetically may thus be found.

Adde one to the yeare of our Lord (because when Christ was borne, the Golden Number was 1) and divide by 19; the

Quotient ſheweth the number of Revolution of the Circle, and the remainder the *Prime*, or *Golden Number*.

EXAMPLE. This preſent year 1648, put 1 to it, and it maketh 1649, this number divided by 19, the Quotient is 86, and 15 remaining, the Quotient ſheweth the number of revolution, and the remainder the *Golden Number* for the propoſed year 1648.

CHAP. II.
Of the EPACT.

THe *Epact* is a number never exceeding 30, becauſe the Moon between change and change, never exceedeth 30 dayes; and thereby the Common Lunar yeare conſiſting of 12 moneths, is leſſe then the Solar yeare by 11 dayes; for to every moneth are attributed but 29 dayes and a halfe, ſo that a yeare containeth but 354 dayes, and the common Solar yeare conſiſting of 365 dayes, exceedeth the Lunar yeare by 11 dayes, from whence the *Epact* taketh its originall. To find this number Arithmetically, doe thus.

Multiply the *Golden Number* for the ſame yeare by 11, and divide that Product by 30, and the remainder after the Diviſion is made ſhall be the *Epact*.

EXAMPLE. This preſent yeare 1648, the *Golden Number* by the precedent rule is 15, this multiplyed by 11 giveth 165, which number being divided by 30 giveth 5 in the Quotient, and 15 remaining, which 15 is the *Epact* for that yeare.

CHAP. III,
Of the Circle of the Sunne, and Dominicall Letter.

THe *Circle of the Sunne* was invented more to find thereby the *Dominicall Letter*, then to ſhew any great changes of the Suns motion therein. This Circle maketh its periodicall revolution in 28 yeares, by helpe of which is known the true order of the *Sunday Letter*. *A.* being placed againſt the firſt day of *January*, and the reſt in their order to the yeares end.

To find out the number of this Circles revolution for any yeare, adde 9 to the yeare of our Lord, and divide that number by 28, and the remainder ſheweth the *Circle of the Sun*.

Ex-

EXAMPLE. This yeare 1648, I desire to know the *Circle of the Sun*. I adde 9 to 1648, and the sum is 1657, this number being divided by 28 giveth 59 for the Quotient, and 5 remaining, which 5 is the *Circle of the Sun* for the required yeare.

CHAP. IV.
Of the Roman Indiction.

THis number consisteth of 15 yeares, and it is set down in the Charters and Writings of the Pronotories of the Bishop of *Rome*. For once in 15 years the Nations were to pay Tribute to the Romans, when they were under the Monarchy: This number sheweth how many yeares are past since the paying of Tribute: and may thus be found.

Adde to the yeare of our Lord given 3, and divide the Summe by 15, the remainder is the *Number of Indiction* required.

EXAMPLE. This present yeare 1648, I would know the *Number of Indiction*, having added 3 to 1648, the Sum is 1651; and this number divided by 15 giveth 110 in the Quotient, and 1 remaining, which shewing that there is one yeare past since the paying of Tribute to the Romans.

CHAP. V.
Of the number of Direction.

THe *number of Direction* is a number of 35, because the time betwixt the highest and lowest falling of any of the moveable Feasts never exceedeth 35 dayes: the order how to find this number Arithmetically cannot be effected, wherefore the Table following in its proper place was by us invented, which sheweth it exactly for ever.

Here note, That the *Golden number*, *the Circle of the Sun*, and *the Dominicall Letter*, begin at *January*: but the *Epact* on the first of *March*: the *Number of Direction* on the 22 of *March*: and the *Roman Indiction* on the first of *September*.

Now, because we would ease you of calculation, we have set down these ensuing Tables, by which, all the fore-mentioned numbers may be found, for any time, either past, present, or to come, by inspection onely, both for the *Julian* or *English* accompt, and for the *Romane* or *beyond Sea* accompt.

CHAP. VI.

A Table shewing the Circle of the Sun and Dominicall Letter, both in the English and Forreign Accompts, for any time past, or to come.

THis Table is divided into foure rowes or Columnes, in the first is placed the yeares of our Lord, in the second the *Circle of the Sun*, in the third the *Dominicall Letter*, according to the English account, and in the fourth the *Dominicall Letter* according to the beyond Sea accompt. Now if you desire to know the *Circle of the Sun*, or *Dominicall Letter*, enter this Table with the yeare of our Lord in the first Columne, & in the same line right against it, you shall have your desire.

The yeares of our Lord.	*Sun circle.*	*Engl. Let.*	*For. Letter*
1648	5	BA	ED
1649	6	G	C
1650	7	F	B
1651	8	E	A
1652	9	DC	GF
1653	10	B	E
1654	11	A	D
1655	12	G	C
1656	13	FE	BA
1657	14	D	G
1658	15	C	F
1659	16	B	E
1660	17	AG	DC
1661	18	F	B
1662	19	E	A
1663	20	D	G
1664	21	CB	FE
1665	22	A	D
1666	23	G	C
1667	24	F	B
1668	25	ED	AG
1669	26	C	F
1670	27	B	E
1671	28	A	D
1672	1	GF	CB
1673	2	E	A
1674	3	D	G
1675	4	C	F

EXAMPLE. In the yeare 1649, I would know the Circle of the Sun and Dominicall Letter in both accompts for that yeare; In the first Columne I find 1649, and right against it in the same line I find 6. G. C. which sheweth, that the Circle of the Sun is 6, and the Dominicall Letter G. in the English accompt, and C in the Forreign. The Circle of the Sun is alwayes the same in both accompts. Note that against what yeare soever you finde two Dominicall Letters, that yeare is leap yeare, and the first of those Letters is to be used in the Calender from the beginning of *January* till St. *Matthias*, or the 24 of *February*, and the other from thence to the yeares end.

EXAMPLE. This present yeare 1648, I finde the Circle of the Sun to be 5, and the Dominicall Letters B A and E D which sheweth 1648 to be leap yeare, and B the first of the two Dominicall Letters is to be accompted for the Sunday Letter till the 24 of *Frebuary*, and the Letter A being the latter of them, for Sunday till the years end.

Note also, that when the yeares in this Table are expired, you may begin them again, by placing 1676 in the roome of 1648, and

1677 in the roome of 1649, and so on, and the contrary, for any time past, and so the Table will be perpetuall.

CHAP. VII.

A perpetuall Table to find the Golden Number *and* Epact *in both accompts.*

THis Table is also divided into 4 Columnes, in the first is placed the yeares of our Lord, in the second the *Prime* or *Golden Number*, in the third the *Epact* for the English, and in the fourth the *Epact* for the Forreign accompts: the use hereof differeth nothing from the former.

EXAMPLE. This present yeare 1648, I desire to know the *Golden Number* and *Epact* in both accompts, having found the yeare 1648 in the first columne, I finde against it in the same line 15. 15. 5. which sheweth, that the *Golden Number* is 15, the *Epact* for the English accompt is also 15, and the *Epact* for the Forreign accompt is 5, the like is to be understood of the rest, the *Golden Number* being alwayes the same in both Accompts. When the yeares in this Table are expired, they are to be continued: as in the former example, by placing 1667 in the place of 1648, *& contra*, for any time past, and so the Table will be perpetuall.

The Years of our Lord.	*Gold.numb.*	*Engl. Epact*	*Forr. Epact.*
1648	15	15	5
1649	16	26	16
1650	17	7	27
1651	18	18	8
1652	19	29	19
1653	1	11	1
1654	2	23	12
1655	3	3	23
1656	4	14	4
1657	5	25	15
1658	6	6	26
1659	7	17	7
1660	8	28	18
1661	9	9	29
1662	10	20	10
1663	11	1	21
1664	12	12	2
1665	13	23	13
1666	14	4	24

And here we will give the Reader notice of a grosse errour lately committed by one J. Pont *in the* 40 page *of his Booke intituled, A Register or Almanack for every year, wherein he thought to have expressed that which cannot possibly be effected, viz. conjoyning these two precedent Tables into one, in which he hath for many years failed in finding the Golden Number and Epact, as may easily appeare to those who shall either take*

take the paines to calculate them, or compare them with Almanacks already past, we will instance in one Example.

In the yeare 1673, *I desire to know the Golden Number and Epact for that yeare, which according to his Table is* (*though falsly*) 12, 12 *and according to these Tables you shall finde them to be* 2 *and* 22 *which are the true numbers for that yeare, for Arithmetically one being added to the yeare of our Lord and the sum thereof divided by* 19 *giveth* 88 *in the Quotient and* 2 *remaining, which* 2 *is the Golden Number for that yeare* 1673, *In like manner, as for the Epact, the Golden Number* 2 *being multiplyed by* 11 *giveth* 22 *for the Product which* 22 (*because it is lesse then* 30) *is the* Epact *for the same yeare. And herein he deceiveth the Reader, for if you would finde the change of the* Moon (*for which the* Epact *chiefly serveth*) *you shall faile of the truth thereof* 9 *dayes, and in the time of high water in any place you shall misse of your aime* 6 *houres and a halfe. The reason of this errour is, for that the Circle of the Sun consisteth of* 28 *yeares, and the Golden Number but of* 19, *this number of* 19 *could not be twice repeated in* 28 *without the leaving out of* 10 *yeares, which in his Table he hath done and thence proceedeth this errour. So that the Table will be false from* 1671 *to* 1680, *and then true for a time, and afterwards false for* 10 *years, as before.*

The Years of our Lord.	*Indiction.*
1648	1
1649	2
1650	3
1651	4
1652	5
1653	6
1654	7
1655	8
1656	9
1657	10
1658	11
1659	12
1660	13
1661	14
1662	15

CHAP. VIII.

A Table shewing the Roman Indiction *for ever.*

THis Table consisting of two columes (in operation) differeth nothing from the former: for having found the year of our Lord in the first columne, right against it, you have the *Number of Indiction* required.

EXAMPLE. This year 1648, I would know the *Number of Indiction*, having found 1648 in the first columne, right against it, in the second, I finde 1, which is the *Number of Indiction* required: When the years in this Table are expired, they are to be continued, as those before, by placing 1663, in the place of 1648.

CHAP.

CHAP. IX.

A Table shewing the Number of Direction, *by help of which is known all the moveable Feasts and Terms in the yeare for ever, in both Accompts.*

THis Table is divided into 8 severall columnes, in the first towards the left hand is placed the *Primes* or *Golden Numbers*, and in the other seven, the *Numbers of Direction*, then at the head of those 7 columnes, are placed the seven *Dominicall Letters*, the use of the Table is thus. Having found the *Prime* or *Golden Number*, together with the *Dominicall Letter*, you must finde the *Prime* or *Golden Number* in the first columne of this Table, under the Title [*Primes.*] and the *Dominicall Letter* at the head of the Table, and in the common angle or meeting of these two lines one with the other, you shall finde a Number, which Number is the *Number of Direction* for the yeare required,

Pri.	A	B	C	D	E	F	G
1	19	20	21	22	16	17	18
2	5	6	7	8	9	10	11
3	26	27	28	29	30	24	25
4	19	13	14	15	16	17	18
5	5	6	7	8	2	3	4
6	26	27	21	22	23	24	25
7	12	13	14	15	16	10	11
8	33	24	25	29	30	31	22
9	19	20	21	22	23	24	18
10	12	13	7	8	9	10	11
11	26	27	28	29	30	31	32
12	19	20	21	15	16	17	18
13	5	6	7	8	9	10	4
14	26	27	28	29	23	24	25
15	12	13	14	15	16	17	18
16	5	6	7	1	2	3	4
17	26	20	21	22	23	24	25
18	12	13	14	15	9	10	11
19	33	24	28	29	30	31	32

EXAMPLE. In the year 1649. the *Prime* or *Golden Number*, by the former Table is found to be 16, and the *Dominicall Letter* G: wherefore having found 16 in the first columne, and G in the head of the Table, I guide my eye down from G, till I come against 16 in the first columne, & there I finde 4: which 4 is the *Number of Direction* for the year 1649, the like may be done for any time either past or to come.

But one thing is to be observed in the use of this Table, *viz.* That if the year wherein you seeke this Number be Leap year, and have two *Dominicall Letters*, you must enter this Table with the last of them, because the former of them is out of date the 24 of *February*, and the *Number of Direction* taketh not beginning till the 22 of *March*.

Ex-

EXAMPLE. Of this yeare 1648 the *Dominicall Letters* were *B*: *A*: Now for finding of this *Number of Direction* I make use of *A*, the latter of them, not at all regarding the former, there being no use thereof in this case.

Now if you would know the *Number of direction* according to the Roman account you must enter this Table with the *Golden Number* and *Dominicall Letter* belonging to the *Roman accompt*, as you did before with the *Julian*.

EXAMPLE. In the yeare 1649, I finde the *Golden Number* for the Roman accompt (which is alwayes the same with the Julian or Englisn) to be 16, and the *Dominicall Letter* for the Roman accompt to be C. with these two numbers I enter the Table as before; finding 16 in the first columne, and C in the head of the Table, and in the common angle or meeting of these two lines, I finde 7 which is the *Number of Direction* required.

CHAP. X.

A Table shewing the Moneth and day of the Moneth on which any of the Moveable Feasts, *or* Termes *in the yeare shall fall for ever.*

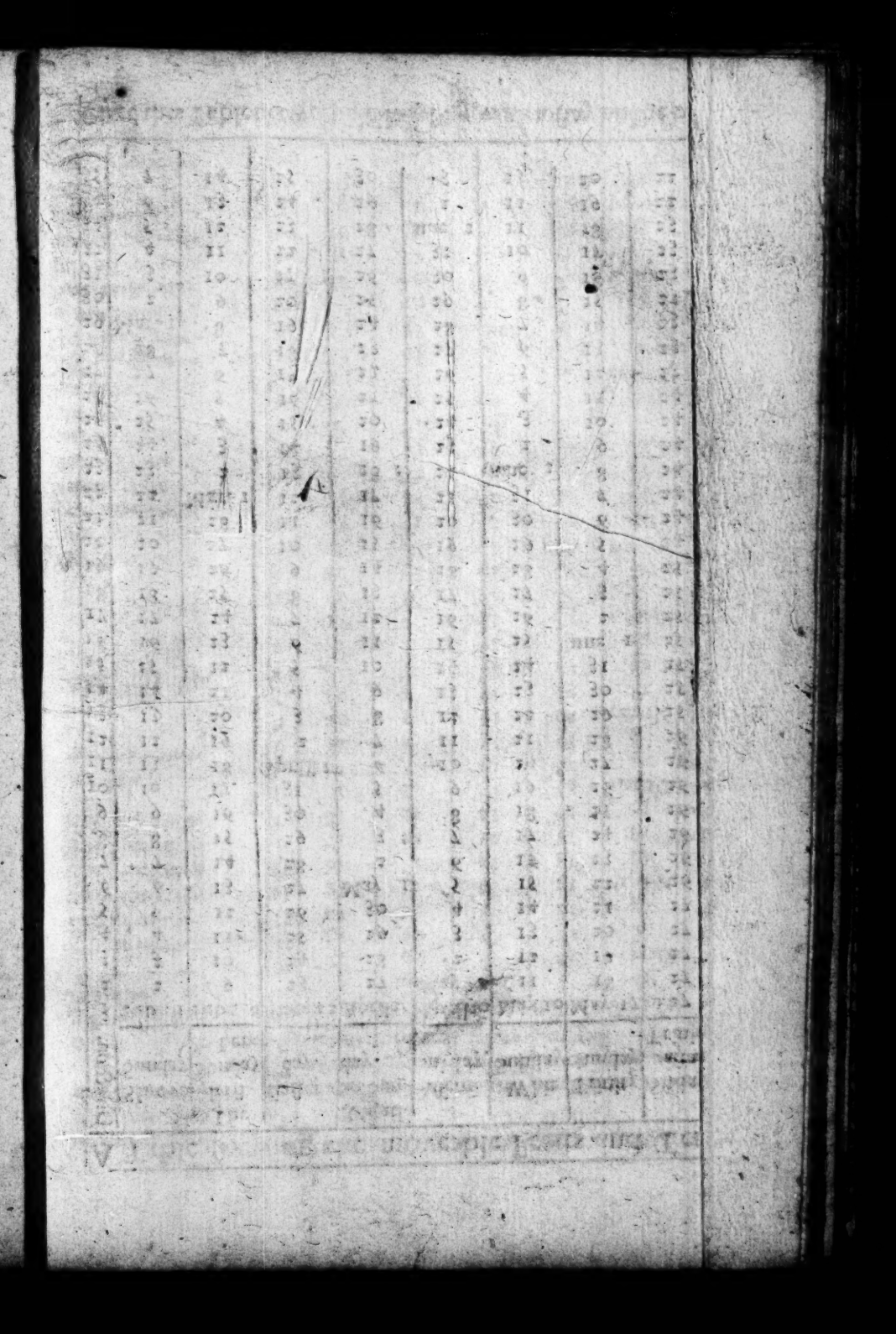
THis Table needeth no explaination, for having found the Number of Direction by the precedent Table you must finde the same number in the first columne of this Table towards the left hand, under the Title [*Direction*] and in the same line, without further trouble you have all the moveable Feasts and Termes in the yeare for ever, according to the Titles placed over the head of each columne.

EXAMPLE. In the fore-mentioned year 1648, I would know the Moneth, and day of the Moneth on which *Shrove Sunday*, *Easter day*, *whit Sunday*, *Advent Sunday*, &c. shall fall; having found by the former Table the *Number of Direction* to be 4, I looke for 4 in the first columne of this Table, under the Title [*Direction*] and right against it in the same line I finde, *Shrove Sunday* to be the 4 of *February*. *First Sunday in Lent* the 11 of *February*. *Easter day* the 25 of *March*. *Rogation Sunday*, *April* 29. *Ascention day*, *May* 3. *whit Sunday*, *May* 13. *Trinity Sunday May* 20. Sundayes after *Trinity* 27. *Advent Sunday*, *December* 2. *Easter* Terme begins *April* the 11, and ends *May* the 7. And *Trinitie* Terme begins *May* 25, and

A Table ſhewing the moveable Feaſts and Terms for ever, in both Accompts.

Direction.	Shrove Sunday	The firſt Sunday in Lent	Eaſter day.	Rogation Sunday.	Aſſention day.	Whit Sunday	Trinity Sunday	Sũdays after Trinity	Advent Sunda.	Eaſter Terme begins.	Faſter Terme ends.	Trinity Terme begins.	Trinity Terme ends.	Direction.
1	Febr. 1	Febr. 8	Mar. 22	April 26	April 30	May 10	May 17	27	No. 29	Aprill 8	May 4	May 22	June 10	29
2	2	9	23	27	May 1	11	18	27	30	9	5	23	11	30
3	3	10	24	28	2	12	19	27	Dece. 1	10	6	24	12	31
4	4	11	25	29	3	13	20	27	2	11	7	25	13	32
5	5	12	26	30	4	14	21	27	3	12	8	26	14	33
6	6	13	27	May 1	5	15	22	26	Nov 27	13	9	27	15	34
7	7	14	28	2	6	16	23	26	28	14	10	28	16	35
8	8	15	29	3	7	17	24	26	29	15	11	29	17	1
9	9	16	30	4	8	18	25	26	30	16	12	30	18	2
10	10	17	31	5	9	19	26	26	Dece. 1	17	13	31	19	3
11	11	18	Aprill 1	6	10	20	27	26	2	18	14	June 1	20	4
12	12	19	2	7	11	21	28	26	3	19	15	2	21	5
13	13	20	3	8	12	22	29	25	Nov 27	20	16	3	22	6
14	14	21	4	9	13	23	30	25	28	21	17	4	23	7
15	15	22	5	10	14	24	31	25	29	22	18	5	24	8
16	16	23	6	11	15	25	June 1	25	30	23	19	6	25	9
17	17	24	7	12	16	26	2	25	Dece. 1	24	20	7	26	10
18	18	25	8	13	17	27	3	25	2	25	21	8	27	11
19	19	26	9	14	18	28	4	25	3	26	22	9	28	12
20	20	27	10	15	19	29	5	24	Nov 27	27	23	10	29	13
21	21	28	11	16	20	30	6	24	28	28	24	11	30	14
22	22	Mar. 1	12	17	21	31	7	24	29	29	25	12	July 1	15
23	23	2	13	18	22	June 1	8	24	30	30	26	13	2	16
24	24	3	14	19	23	2	9	24	Dece. 1	May 1	27	14	3	17
25	25	4	15	20	24	3	10	24	2	2	28	15	4	18
26	26	5	16	21	25	4	11	24	3	3	29	16	5	19
27	27	6	17	22	26	5	12	23	Nov 27	4	30	17	6	20
28	28	7	18	23	27	6	13	23	28	5	31	18	7	21
29	Mar. 1	8	19	24	28	7	14	23	29	6	June 1	19	8	22
30	2	9	20	25	29	8	15	23	30	7	2	20	9	23
31	3	10	21	26	30	9	16	23	Dece. 1	8	3	21	10	24
32	4	11	22	27	31	10	17	23	2	9	4	22	11	25
33	5	12	23	28	June 1	11	18	23	3	10	5	23	12	26
34	6	13	24	29	2	12	19	22	Nov 27	11	6	24	13	27
35	7	14	25	30	3	13	20	22	28	12	7	25	14	28

Place this Table between Folio 8 & 9, with a ſtay on the back, ſo that it may open with the Book,



25 and ends *June* 13. The other two Terms are fixed, for *Hilary Terme* begins the 23 of *January* (if not Sunday) and ends the 12 or 13 of *February*, and *Michaelmas* Terme begins the 23 of *October* (if not Sunday) and ends the 28 or 29 of *November*.

But you are to note in the use of this Table, that in the Leap yeares those Feasts which fall in *February* fall one day after what is found in this Table, because in those yeares *February* hath 29 dayes, and *Matthias* is the 25 day, and the *Dominicall Letter* F being twice repeated, standeth both against the 24 and 25 dayes, and both those dayes, are by the Latines called the 6 *Kalends* of *March*.

If you would know when any of these moveable Feasts shall fall according to the Romane Accompt, you must enter the same Table with the *Number of Direction* belonging to the Romane Accompt, in the last Columne of this Table, towards the right hand, under the Title [*Direction.*] and in the same line, without farther trouble, you shall have all the moveable Feasts and Terms under their respective Titles. This needeth no Example.

Another way to finde the Moveable Feasts.

SEeke the change of the Moon in *February*, (or if the Moone change not in *February*, then take the next change after) and the next *Tuesday* after is *Shrove Tuesday*, but if the Moon change upon *Tuesday*, then the next *Tuesday* following is *Shrove Tuesday*; then the next *Sunday* is the first *Sunday* in *Lent*; six *Sundayes* after is *Easter day*; to which adde five Weeks, so have you *Rogation Sunday*; then is it 4 dayes more to *Ascension day*; and ten dayes after is *Whitsunday*; the next *Sunday* after, is *Trinity Sunday*; and the next *Thursday* is *Corpus Christi day*.

The Act of Batchelours in *Cambridge* and *Oxford*, is the first day of Lent.

The Act of Masters is in *Cambridge July* 3. But in *Oxford*, *July* 8.

The Intervall of time between Easter, *and ſome other moveables in the Yeare.*

Septuageſima. Seragesima. Quinquagesima. Quadragesima.	before Easter	9 8 7 6	Weeks.
Rogation Sunday. Whit Sunday. Trinity Sunday.	after Easter	5 7 8	Weeks.

Here is to be noted, that thoſe Feaſts are fixed, which fall alwayes on the ſame day of the Moneth, and alter onely in the day of the weeke, ſuch are *Matthew, Peter, Simon* and *Jude, &c.* And thoſe are moveable, which alwayes retaine the ſame day of the weeke, and vary in the day of the moneth, as *Easter, Penticoſt, Trinity, Advent, &c.*

The Returns of the Terms.

Hillary Term.	*Trinity* Term.
Octab. Hillary.	Craſtino Trinitatis.
Quind. Hillary.	Octabis Trinitatis.
Craſtino Purificationis.	Quind. Trinitatis.
Octabis Purificationis.	Treſ: Trinitatis.

Easter Term.	*Michaelmas* Term.
Quind. Paſch.	Tres Michael.
Tres Paſch.	Mense Michael.
Mense Paſch.	Craſt. Anim.
Quinq: Paſch.	Craſt. Martini.
Craſt. Ascen.	Octab. Martini.
	Quind. Martinis.

Note that the Exchequer openeth alwayes 8 dayes before the beginning of any Terme, except *Trinity*, and then it openeth but 4 dayes before.

The second Part:

Containing an

EPHEMERIS

Or DIARIE for xix Years to come: Beginning *Anno* 1648, and continuing till *Anno* 1667.

Whereby may be found the true places of the Sun and Moon: Alſo the exact time of the New and Full Moon: Together with all the Eclipſes both *Solar* and *Lunar*, the time when they ſhall happen, and the quantity of obſcuration.

With a Type or Figure of every particular Eclipſe, both Solar *and* Lunar.

Whereunto is added other Aſtronomicall Tables exactly calculated, to finde the true place of the Sun and Moon at any time, from *Anno* 1640, to *Anno* 1700. Alſo all the Conjunctions, Oppoſitions, and conſequently the Eclipſes both *Solar* and *Lunar*, may exactly be found, and by help of which Tables, the following *Ephemeris* may be continued, and made perfect for 52 Years compleat, and by conſequence for ever.

Alſo other Tables of more vulgar uſe are added, for the benefit of thoſe who are not Mathematically diſciplin'd.

By *V. W.* and *W. L.*

The Names and Characters of the XII. *Cœlestiall* SIGNES.

Aries.	Taurus.	Gemini.	Cancer.
♈	♉	♊	♋
Leo.	Virgo.	Libra.	Scorpio.
♌	♍	♎	♏
Sagitarius	Capricorn.	Aquarius.	Pisces.
♐	♑	♒	♓

The Names and Characters of the VII. *Planets, with the Head and tail of the Dragon.*

Saturn.	Jupiter.	Mars.	Sol	Venus
♄	♃	♂	☉	♀
Mercury.	Luna.	Dragons Head.		Dragons Tail.
☿	☾ ●	☊		☋

The Names and Characters of the Aspects, *both Old and New.*

Conjunction.	Semisextile.	Sextile.
☌	SS	⚹
Quintile.	Quartile.	Tridecile.
Q	□	Td
Trine	Biquintile.	Opposition.
△	Bq	☍

The miſcarryage of a Letter hath been the unhappy parent of theſe following *Errata's* (which were not perceived till part of the Impreſſion was divulged) thus to be corrected.

The Page, and day of the Moneth, on which theſe faults are to be amended.	Prime ☌	New ☾, and the ☉ Eclips		
Page 15, day 21, inſert	17	10	50	p
Page 17, day 16, inſert	12	12	52	
Page 17, day 29, inſert	19	0	46	a
Page 19, day 28, inſert	11	15	6	
Page 21, day 3, inſert	5	6	38	p
Page 21, day 28, inſert	19	16	30	
Page 23, day 25, inſert	3	5	1	32
Page 23, day 20, *dele*	2	17	13	
Page 25, day 27, inſert	8	10	47	a
Page 33, day 5, inſert	7	14	41	
Page 35, day 5, inſert	15	12	33	
Page 37, day 13, inſert	17	2	24	a

The Page, and day of the Moneth, on which theſe faults are to be amended.	Prime ☌	Full ☾, and her Eclipſe.		
Page 15, day 12, inſert	3	4	40	a
Page 15, day 2, inſert	12	15	7	
Page 17, day 25, inſert	18	9	5	a
Page 19, day 27, inſert	7	22	43	
Page 19, day 28, reade	15	6	20	p
Page 21, day 12, inſert	11	9	33	a
Page 21, day 30, inſert	12	3	22	a
Page 23, day 7, inſert	6	2	37	a
Page 23, day 21, inſert	2	5	13	a
Page 23, day 25, inſert	7	16	24	
Page 25, day 9, inſert	3	52	18	
Page 25, day 25, inſert	7	26	0	
Page 25, day 27, *dele*	8	10	45	a
Page 27, day 25, inſert	7	4	48	a
Page 37, day 27, inſert	17	8	40	p

Place this Folio 12.

The Names and Characters

the XII. *Cælestiall* SIGNES.

Aries.	Taurus.	Gemini.	Can
♈	♉	♊	♋
Leo.	Virgo.	Libra.	Scorp
♌	♍	♎	♏
Sagitarius	Capricorn.	Aquarius.	Piſces
♐	♑	♒	♓

The Names and Characters of th

VII. *Planets, with the Head and tail of the Dragon.*

Saturn.	Jupiter.	Mars.	Sol	Venu
♄	♃	♂	☉	♀
Mercury.	Luna.	Dragons Head.	Dragons T	
☿	☾ ●	☊	☋	

The Names and Characters of

Aſpects, *both Old and New.*

Conjunction.	Semiſextile.	Sextile.
☌	⚺	⚹
Quintile.	Quartile.	Tridecile.
Q	□	Td
Trine	Biquintile.	Oppoſitio
△	Bq	☍

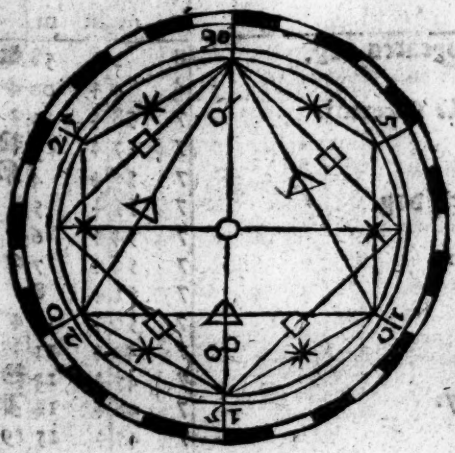
The miscarryage of a Letter hath been the unhappy parent of these following *Errata's* (which were not perceived till part of the Impression was divulged) thus to be corrected.

The Page, and day of the Moneth, on which these faults are to be amended.	Prime ☌	New ☾, and the ☉Eclips	
Page 15, day 21, insert	17	10 50	p
Page 17, day 16, insert	12	12 52	
Page 17, day 29, insert	19	0 46	a
Page 19, day 28, insert	11	15 6	
Page 21, day 3, insert	5	6 38	p
Page 21, day 28, insert	19	16 30	
Page 23, day 25, insert	3	5 1 32	
Page 23, day 20, *dele*	2	17 13	
Page 25, day 27, insert	8	10 47	a
Page 33, day 5, insert	7	14 41	
Page 35, day 5, insert	15	12 33	
Page 37, day 13, insert	17	2 24	a

The Page, and day of the Moneth, on which these faults are to be amended.	Prime ☌	Full ☾, and her Eclipse.	
Page 15, day 12, insert	3	4 40	a
Page 15, day 2, insert	12	15 7	
Page 17, day 25, insert	18	9 5	a
Page 19, day 27, insert	7	22 43	
Page 19, day 28, reade	15	6 20	p
Page 21, day 12, insert	11	9 33	a
Page 21, day 30, insert	12	3 22	a
Page 23, day 7, insert	6	2 37	a
Page 23, day 21, insert	2	5 13	a
Page 23, day 25, insert	7	16 24	
Page 25, day 9, insert	3	52 18	
Page 25, day 25, insert	7	26 0	
Page 25, day 27, *dele*	8	10 45	a
Page 27, day 25, insert	7	4 48	a
Page 37, day 27, insert	17	8 40	p

Place this Folio 12.

A Scheme of the Aſpects.



A Table of the Aſpects both Old and New according to EICHSTADIUS.

Characters	Names of the Aſpects.	Diſtat S	Diſtat D	The ſeverall ꝑses, or ſhapes of the Moons light.
☌	Conjunction	0	00	Noviluniu̇m, The New Moon.
SS	Semiſextile	1	00	
⚹	Sextile	2	00	Corniculata, The Horned Moon.
⚺	Quintile	2	12	
□	Quartile	3	00	Semiplena, Moon halfe full of light.
Td	Tridecile	3	18	
△	Trine	4	00	Gibboſa, Moon three parts light.
Bq	Biquintile	4	24	
☍	Oppoſition	6	00	Plen lunium, The full Moon.

January hath xxxj dayes.

Moneth dayes	Weeke dayes	Fixed Feasts and Termes, &c.	Sunne rising. h.	m.	Sunne setting h.	m.	The Latine accompt.	Romane	Accompt
1	A	Newyeares day.	8	2	3	58	Kalend.	D	11
2	B		8	0	4	00	4	E	12
3	C	*Natalis* Ciceronis	7	58	4	2	3	F	13
4	D		7	57	4	3	Prid.	G	14
5	E		7	56	4	4	Nonas.	A	15
6	F	Twelf day.	7	55	4	5	8	B	16
7	G		7	54	4	6	7	C	17
8	A	Lucian.	7	53	4	7	6	D	18
9	B		7	52	4	8	5	E	19
10	C		7	50	4	10	4	F	20
11	D		7	49	4	11	3	G	21
12	E		7	47	4	13	Prid.	A	22
13	F	Hilary.	7	46	4	14	Idus.	B	23
14	G		7	45	4	15	19	C	24
15	A		7	44	4	16	18	D	25
16	B	Jo. Schonerus *nasceit. an.* 1477	7	42	4	18	17	E	26
17	C		7	41	4	19	16	F	27
18	D		7	39	4	21	15	G	28
19	E	*Natal.* Copernicus, *an.* 1472.	7	38	4	22	14	A	29
20	F	Fabian.	7	36	4	24	13	B	30
21	G	Agnes.	7	34	4	26	12	C	31
22	A	Vincent.	7	32	4	28	11		Febr.
23	B	Term begins, *if not Sunday.*	7	31	4	29	10	D	2
24	C		7	30	4	30	9	E	3
25	D	*conversion of* Paul.	7	28	4	32	8	F	4
26	E		7	26	4	34	7	G	5
27	F		7	25	4	35	6	A	6
28	G		7	23	4	37	5	B	7
29	A		7	21	4	39	4	C	8
30	B		7	20	4	40	3	D	9
31	C		7	18	4	42	Prid.	E	10

Astronomicall Calculations for xix yeares.

Moneth dayes.	Prime ☌	New Moone and the Suns Eclipse.			Digits of Sun Eclipsed.	Prime ☍	Full Moone and her Eclipse.			Digits of Moon Eclipsed.
1	19	4	47	a		4	8	37	p	3.1-3
2	16	10	55	p		12	15	7		
3						1	5	28	p	
4	5	1	21	p						
5						9	10	0	a	
6	13	7	7	a	●					
7						17	8	15	p	
8	2	3	50	p						
9						6	10	40	a	
10	10	4	23	a		14	2	16	a	
11	18	0	45	p		23	4	40	a	
12	7	8	40	p		11	1	30	p	
13										
14	15	6	11	p		19	3	25	p	
15										
16	4	1	45	p	8.1-3	8	10	30	a	
17		1	14	p		16	1	14	p	
18	12	6	28	a		5	10	40	p	
19	1	2	3	p						
20	9					13	6	0	a	4.1-2
21	17	10	50	☌		2	5	18	a	
22										
23	6	10	42	a		10	4	2	p	
24										
25	14	6	47	p		18	6	0	a	
26										
27	3	2	5	p	1	7	8	34	a	
28						15	11	40	p	
29	11	3	38	a						
30	19	3	12	p						
31	8	10	11	p						

February hath xxviij. dryes.

Moneth dayes	Weeke dayes	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane Accompt.
1	D		7	17	4	43	Kalends	G 11
2	E	Purification of Mary.	7	16	4	44	4	A 12
3	F		7	14	4	46	3	B 13
4	G		7	13	4	47	Prid.	C 14
5	A	Agathe.	7	11	4	49	Nonas.	D 15
6	B		7	10	4	50	8	E 16
7	C		7	8	4	52	7	F 17
8	D		7	6	4	54	6	G 18
9	E		7	4	4	56	5	A 19
10	F		7	2	4	58	4	B 20
11	G		6	59	5	1	3	C 21
12	A	Haly *naſ. Anno*, 356.	6	58	5	2	Prid.	D 22
13	B		6	56	5	4	Idus	E 23
14	C	Valentine.	6	55	5	5	16	F 24
15	D		6	54	5	6	15	G 25
16	E	*Natal.* Melanthonis, *An.* 1497	6	53	5	7	14	A 26
17	F		6	51	5	9	13	B 27
18	G		6	49	5	11	12	C 28
19	A		6	46	5	14	11	Mar.
20	B		6	44	5	16	10	E 2
21	C		6	42	5	18	9	F 3
22	D		6	40	5	20	8	G 4
23	E	Term ends.	6	38	5	22	7	A 5
24	F	Matthias.	6	35	5	25	6	B 6
25	G		6	32	5	28	5	C 7
26	A		6	30	5	30	4	D 8
27	B		6	27	5	33	3	E 9
28	C		6	24	5	36	Prid.	F 10

When it is Leap Yeare, *February* hath 29 dayes, and *Matthias* is the 25 day, and both the 24 and 25 are called the 6 *Kalends* of *March*.

Astronomicall Calculations, for xix years.

Moneth dayes	Prime ☌	New Moon, and the Suns Eclips.			Digits of Sun Eclipsed.	Prime ☍	Full Moone, and her Eclips.			Digits of Moon Eclipsed.
1	16	1	18	p		12	2	16	p	●
2	5	9	22	p		1	10	20	a	
3										
4						9	6	58	a	
5	13	2	15	a						
6						17	0	30	p	
7	2	8	28	a	●	6	11	48	p	
8	10	4	20	p						
9	18	11	14	p		14	8	18	a	
10						3	3	44	p	
11	7	8	52	a						
12						11	3	11	a	☾. 1-4
13	15	0	42	p						
14						19	10	15	a	
15	4	7	36	a						
16	12	12	52			8	4	35	a	
17	1	5	14	p	●	16	1	15	a	
18						5	8	51	a	
19	9	3	46	a		13	3	51	p	
20	17	0	24	a						
21						2	6	32	a	●
22	6	2	26	a						
23	14	8	20	a		10	1	7	a	
24										
25						18	9	5	a	
26	3	4	31	a		7	11	8	p	
27	11	4	46	p	●					
28						15	9	15	p	
29	19	0	46	a		4	4	30	p	

March hath xxxj dayes.

Moneth days	Weeke dayes	Fixed Feasts and Termes, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane Accompt.
1	D	David.	6	23	5	37	Kalend.	11
2	E		6	20	5	40	6	12
3	F		6	18	5	41	5	13
4	G		6	16	5	44	4	14
5	A		6	14	5	46	3	15
6	B		6	11	5	49	Prid.	16
7	C		6	09	5	51	Nonas.	17
8	D		6	07	5	53	8	18
9	E		6	05	5	55	7	19
10	F		6	03	5	57	6	20
11	G	*Equall Day and Night.*	6	00	6	00	5	21
12	A		5	50	6	02	4	22
13	B		5	57	3	03	3	23
14	C		5	56	6	04	Prid.	24
15	D		5	54	6	06	Idus.	25
16	E		5	52	6	08	17.	26
17	F		5	50	6	10	16	27
18	G	Edward.	5	48	2	12	15	28
19	A		5	46	6	14	14	29
20	B	*Natalis* Ovidi.	5	44	6	16	13	30
21	C		5	42	6	18	12	31
22	D		5	40	6	20	11	April 1
23	E		5	39	6	21	10	2
24	F		5	37	6	23	9	3
25	G	Annunciation of Mary.	5	36	6	24	8	4
26	A		5	34	6	26	7	5
27	B		5	32	6	28	6	6
28	C		5	30	6	30	5	7
29	D		5	28	6	32	4	8
30	E		5	26	6	34	3	9
31	F		5	24	6	36	Prid.	10

Astronomicall Calculations. for xix years.

March dayes	Prime ☌	New Moon and the Suns Eclips.			Digits of Sun Eclipsed.	Prime ☍	Full Moone, and her Eclips.			Digits of Moo. Eclipse.
1	8	8	44	a						
2						12	1	46	a	
3	16	6	21	a						
4						1	4	6	a	19.12
5	5	1	35	a						
6	13	8	8	p		9	1	22	a	
7										
8	2	6	8	p		17	1	21	a	
9						6	10	18	a	
10	10	2	8	a	●	14	5	40	p	
11	18	10	15	a						
12	7	7	30	p		3	3	50	a	
13						11	6	0	p	
14	15	6	44	a						
15	4	11	25	p		19	3	34	a	11.1-8
16										
17	12	3	18	p		8	0	30	a	
18						16	10	52	a	
19	1	2	00	a		5	5	44	p	
20	9	9	32	a	●					
21						13	1	43	a	
22	17	1	53	a		2	10	8	p	
23										
24	6	at noone				10	4	24	p	
25	14	1	50	p						
26						18	11	25	p	
27	3	7	27	p		7	22	43		
28	11	15	6			15	6	20	p	
29	19	9	50	a	11.13					
30	8	7	46	p		4	2	32	a	
31										

Aprill hath xxx. dayes.

Moneth dayes.	Weeke dayes	Fixed Feasts and Terms, &c.	Sunne riſing. h.	m.	Sunne ſetting. h.	m.	The Latine accompt.	Romane Accompt.
1			5	20	6	40	Kalends	11
2			5	18	6	42	4	12
3		Trapezuntias, *naſcit. an.* 1396	5	16	6	44	3	13
4			5	14	6	46	Prid.	14
5			5	12	6	48	Nonas.	15
6			5	10	6	50	8	16
7		*Natalis* Platonis.	5	07	6	53	7	17
8			5	04	6	56	6	18
9			5	02	6	58	5	19
10			5	00	7	00	4	20
11			4	58	7	02	3	21
12			4	57	7	03	Prid.	22
13			4	55	7	05	Id	23
14			4	53	7	07	18	24
15			4	52	7	08	17	25
16			4	50	7	10	16	26
17			4	48	7	12	15	27
18			4	46	7	14	14	28
19			4	44	7	16	13	29
20			4	42	7	18	12	30
21			4	40	7	20	11	May 1
22			4	39	7	21	10	2
23		S. George.	4	37	7	23	9	3
24			4	35	7	25	8	4
25		Mark Evangeliſt.	4	33	7	27	7	5
26			4	31	7	29	6	6
27			4	29	7	31	5	7
28			4	27	7	33	4	8
29			4	25	7	35	3	9
30			4	23	7	37	Prid.	10

Astronomicall Calculations for xix yeares.

Moneth dayes.	Prime ☌	New Moone and the Suns Eclipse.			Digits of Sun Eclipsed.
1	16	11	52	p	
2					
3	5	6	38	p	
4	13	23	38		
5	3	6	30	p	
6					
7	2	3	30	a	
8	10	10	26	a	
9	18	9	58	p	●
10					
11	7	0	50	p	
12	15	11	0	p	
13					
14	4	At noon.			
15	12	11	40	a	
16					
17	1	11	9	a	
18	9	6	30	p	
19					
20					
21	17	4	46	p	●
22	6	11	20	a	
23					
24	14	5	50	a	
25					
26	3	3	46	a	
27	11	11	26	a	
28	19	16	30		
29	8	6	6	a	
30					

☌ Prime	Full Moone and her Eclipse.			Digits of Moon Eclipsed.
1	9	14	p	
9	3	28	p	●
17	11	3	a	
6	3	35	p	
14	2	1	a	
3	4	55	p	
11	9	33	a	
19	7	14	p	
8	9	15	a	●
16	7	0	p	
5	3	27	a	
13	11	30	a	
2	1	40	p	
10	8	46	p	
18	10	46	a	
7	6	46	p	☾
15	2	44	a	
4	1	5	p	
12	3	22		

May hath xxxj dayes.

Moneth dayes.	Weeke dayes.	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane	Accompt.
1	☿	Philip and Iacob.	4	22	7	38	Kalend.		11
2	♃		4	21	7	39	6		12
3	♄		4	20	7	48	5		13
4	☉		4	19	7	41	4		14
5	☾		4	17	7	43	3		15
6	♂	JOHN PORT LATINE.	4	15	7	45	Pridi.		16
7	☿		4	13	7	47	Nonas.		17
8	♃		4	12	7	48	8		18
9	♄		4	11	7	49	7		19
10	☉		4	10	7	50	6		20
11	☾		4	09	7	51	5		21
12	♂		4	07	7	11	4		22
13	☿		4	06	7	54	3		23
14	♃		4	05	7	55	Pridi.		24
15	♄		4	03	7	57	Id		25
16	☉		4	02	7	58	17		26
17	☾		4	01	7	59	16		27
18	♂		3	59	8	01	15		28
19	☿	Dunston.	3	58	8	02	14		29
20	♃		3	56	8	04	13		30
21	♄		3	55	8	05	12		31
22	☉		3	54	8	06	11	June.	
23	☾		3	53	8	07	10		2
24	♂		3	53	8	07	9		3
25	☿		3	52	8	08	8		4
26	♃	Augustine.	3	52	8	08	7		5
27	♄		3	52	8	04	6		6
28	☉		3	51	8	09	5		7
29	☾		3	51	8	09	4		8
30	♂		3	50	8	10	3		9
31	☿		3	50	8	10	Pridi.		10

Astronomicall Calculations, for xix years.

Moneth dayes.	Prime ☌	New Moone and Suns Eclipse.			Digits of Sun Eclipsed.	Prime ☍	Full Moon and her Eclipse.			Digits of Moon Eclipsed.
1	16	3	55	p						
2						1	1	32	p	
3	5	9	39	a						
4	13	12	18	p		9	5	30	a	
5						17	7	46	p	8.1-8
6	2	0	11	a						
7	10	6	10	p		6	2	37	a	
8						14	10	16	a	
9	18	10	43	a						
10						3	6	53	a	
11	7	3	49	a	●					
12	15	0	52	p		11	1	9	a	
13						19	7	54	a	
14	4	1	56	a		8	7	13	p	
15	12	11	42	a						
16	1	5	55	p		16	2	22	a	20.3-4
17						5	0	48	a	
18	9	4	19	a		13	10	23	p	
19										
20				p						
21	17	8	0	a						
22	6	2	49	a	●	2	4	13	a	
23		3	30			10	11	36	p	
24										
25	3	51	32			18	7	47	p	
26	11	6	32	p		7	16	24		
27	19	5	56	a		15	11	57	a	●
28	8	8	40	p		4	12	54	p	
29										
30						12	5	22	p	
31	16	6	44	a	2					

June hath xxix dayes.

Month dayes	Week dayes	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting h.	m.	The Latine Accompt.	Romane Accompt.
1	G		3	50	4	10	Kalend.	A 11
2	A		3	49	8	11	4	B 12
3	B		3	49	8	11	3	C 13
4	C		3	49	8	11	Prid.	D 14
5	D	Boniface.	3	48	8	12	Nonas.	E 15
6	E	*Natal.* Regiomontani, *an.* 1436	3	48	8	12	8	F 16
7	F		3	48	8	12	7	G 17
8	G		3	47	8	13	6	A 18
9	A		3	47	8	13	5	B 19
10	B	*The longest day.*	3	47	8	13	4	C 20
11	C	Barnaby.	3	47	8	13	3	D 21
12	D		3	47	8	13	Prid.	E 22
13	E		3	47	8	13	Id.	F 23
14	F		3	47	8	13	18	G 24
15	G		3	48	8	13	17	A 25
16	A		3	48	8	12	16	B 26
17	B		3	48	8	12	15	C 27
18	C		3	49	8	12	14	D 28
19	D		3	49	8	11	13	E 29
20	E		3	49	8	11	12	F 30
21	F		3	50	8	10	11	July
22	G		3	50	8	10	10	A 2
23	A		3	51	8	09	9	B 3
24	B	John Baptist.	3	51	8	09	8	C 4
25	C		3	52	8	08	7	D 5
26	D		3	52	8	08	6	E 6
27	E		3	53	8	07	5	F 7
28	F		3	54	8	06	4	G 8
29	G	Peter and Paul.	3	55	8	05	3	A 9
30	A		3	56	8	04	Prid.	B 10

Astronomicall Calculations, for xix years.

Moneth dayes	Prime ☌	New Moone, and the Suns Eclips.			Digits of Sun Eclipsed.		Prime ☍	Full Moone, and her Eclips.			Digits of Moon Eclipsed.
1	5	11	25	p	●		1	1	12	a	
2							9	4	52	p	
3	13	0	26	a							
4	2	6	14	p			17	2	40	a	
5							6	9	56	a	●
6	10	4	5	a			14	8	8	p	●
7											
8	18	0	25	a							
9	7	6	51	p			3	52	18		
10							11	4	12	p	
11	15	0	34	a	●		19	6	6	p	
12	4	11	17	a			8	15	13		
13	12	6	55	p			16	7	2	p	
14											
15	1	2	42	a			5	8	47	p	12.5-6
16	9	2	48	p							
17							15	10	32	a	
18	17	9	44	p							
19							2	7	52	p	
20	6	4	46	p							
21							10	0	34	p	
22	14	7	28	a	7.2-3						
23	3	6	35	p			18	3	6	a	
24	12	13	36				15	10	32	p	
25	19	5	40	p			7	26	0		
26							4	1	52	p	●
27	8	10	47	a			8	10	45	a	
28	16	7	40	a			12	8	10	a	
29											
30											

July hath xxxj dayes.

Moneth days.	Weeke dayes	Fixed Feasts and Termes, &c.	Sunne rising. h.	m.	Sunne setting h.	m.	The Latine accompt.	Romane Accompt.
1	☉		3	57	8	03	Kalend.	11
2	☽		3	57	8	03	6	12
3	♂	Cornelius.	3	58	8	02	5	13
4	☿		3	59	8	01	4	14
5	♃		4	00	8	00	3	15
6	♀	Hector.	4	02	7	58	Nud.	16
7	♄		4	03	7	57	Nonas.	17
8	☉		4	05	7	55	8	18
9	☽		4	06	7	54	7	19
10	♂	7 Brethren.	4	08	7	52	6	20
11	☿		4	09	7	51	5	21
12	♃		4	11	7	49	4	22
13	♀		4	12	7	48	3	23
14	♄	Bonaventure.	4	13	7	47	Nud.	24
15	☉	Swithin	4	14	7	46	Idus.	25
16	☽		4	15	7	45	17	26
17	♂		4	16	7	44	16	27
18	☿		4	17	7	43	15	28
19	♃		4	18	7	42	14	29
20	♀		4	20	7	40	13	30
21	♄		4	21	7	39	12	31
22	☉	Magdalen.	4	23	7	37	11	Aug. 2
23	☽		4	25	7	35	10	3
24	♂		4	27	7	33	9	4
25	☿	James Apostle.	4	29	7	31	8	5
26	♃		4	30	7	30	7	6
27	♀		4	32	7	28	6	7
28	♄	Sampson.	4	34	7	26	5	8
29	☉		4	36	7	24	4	9
30	☽		4	37	7	23	3	10
31	♂		4	38	7	22	Nud.	

Astronomicall Calculations. for xix years.

Moneth dayes	Prime ☌	New Moon and the Suns Eclips.			Digits of Sun Eclipsed.	Prime ☍	Full Moone, and her Eclips.			Digits of Moon Eclipsed.
1										
2	13	6	46	p	●	9	2	28	a	
3						17	9	22	a	
4	2	11	36	a		6	6	0	p	
5	10	11	12	a						
6						14	5	20	a	
7	18	3	0	p						
8						3	0	25	p	●
9	7	10	30	a						
10	15	10	14	a		11	6	30	a	
11	4	10	46	p	●	19	2	44	a	
12						8	10	20	a	
13	12	1	46	a	●	16	7	25	p	
14	1	1	22	p						
15						5	7	47	a	
16	9	3	51	a						
17						13	0	16	a	0.1-6
18	17	1	36	p						
19						2	9	55	a	
20	6	5	22	a		10	11	55	p	
21	14	3	48	p						
22						18	10	3	a	
23	3	1	30	a	●	15	10	52	a	
24	11	9	23	a						
25	19	7	25	a		7	4	48	a	
26	8	11	10	p		4	4	22	a	
27										
28						12	10	16	a	●
29	16	7	40	a						
30	5	6	20	p		1	1	23	a	
31						9	10	38	a	

August hath xxxj dayes.

Moneth dayes.	Weeke dayes.	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting h.	m.	The Latine accompt.	Romane	Accompt.
1	F		4	39	7	21	Kalend.		11
2	G	Lammas.	4	40	7	20	4		12
3	A		4	43	7	17	3		13
4	B		4	44	7	16	Nid.		14
5	C		4	46	7	14	Nonas.		15
6	D		4	48	7	12	8		16
7	E		4	50	7	10	7		17
8	F		4	52	7	08	6		18
9	G		4	54	7	06	5		19
10	A	Laurence.	4	56	7	04	4		20
11	B		4	58	7	02	3		21
12	C		4	59	7	01	Nid.		22
13	D		5	01	6	59	Id		23
14	E		5	03	6	57	19		24
15	F	Joh. Baptista, *nat. anno* 1530.	5	05	6	55	18		25
16	G		5	06	6	54	17		26
17	A		5	08	6	52	16		27
18	B		5	10	6	50	15		28
19	C		5	12	6	48	14		29
20	D		5	14	6	46	13		30
21	E		5	16	6	44	12		31
22	F		5	18	6	42	11	Sept.	
23	G		5	20	6	40	10		2
24	A	Bartholomew Apostle.	5	22	6	38	9		3
25	B		5	24	6	36	8		4
26	C		5	26	6	34	7		5
27	D		5	28	6	32	6		6
28	E		5	30	6	30	5		7
29	F	John Baptist *Beheaded.*	5	31	6	29	4		8
30	G		5	33	6	27	3		9
31	A		5	35	6	25	Nid.		10

Astronomicall Calculations for xix yeares.

Moneth dayes.	Prime ☌	New Moone and the Suns Eclipse.			Digits of Sun Eclipsed.	Prime ☍	Full Moone and her Eclipse.			Digits of Mo Eclipsed.
1	13	2	17	a		17	5	28	p	
2	2	10	6	a	11.1-6					
3	10	10	20	p		6	3	50	a	
4						14	5	46	p	
5										
6	18	6	27	a						
7	7	12	24			3	3	26	a	●
8	15	6	35	p		11	7	43	p	12.1-3
9						19	10	37	a	
10	4	2	9	a						
11	12	9	7	a		8	1	37	a	
12						16	6	0	a	
13	1	1	19	a	●	5	9	21	p	
14	9	6	35	p		13	8	6	a	
15										
16										
17	17	3	23	a		2	10	49	p	2. 2-3
18	6	4	44	p						
19						10	10	0	a	
20	14	2	28	a		18	5	26	p	
21	3	9	25	a						
22	11	7	6	p	●	7	4	47	a	
23	19	10	47	p		15	1	37	a	
24						4	8	17	p	
25	8	5	37	p						
26						12	2	27	p	
27	16	6	15	p						
28						1	10	54	a	●
29	5	3	0	a		9	6	32	p	
30	13	9	56	a						
31	2	10	0	p		17	3	8	a	

September hath xxx. dayes.

Month dayes	Weeke dayes	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane Accompt.
1	H	Giles.	5	37	6	23	Kalends	B 11
2	A		5	40	6	20	4	C 12
3	B		5	42	6	18	3	D 13
4	C		5	44	6	16	Prid.	E 14
5	D		5	45	6	15	Nonas.	F 15
6	E		5	47	6	13	8	G 16
7	F		5	49	6	11	7	A 17
8	G		5	50	6	10	6	B 18
9	A		5	51	6	09	5	C 19
10	B		5	53	6	07	4	D 20
11	C		5	55	6	05	3	E 21
12	D	*Equall Day and Night.*	5	58	6	02	Prid.	F 22
13	E		6	00	6	00	Id	G 23
14	F	Holy-Crosse.	6	02	5	58	18	A 24
15	G		6	04	5	56	17	B 25
16	A		6	06	5	54	16	C 26
17	B	Lambert.	6	08	5	52	15	D 27
18	C		6	10	5	50	14	E 28
19	D		6	12	5	48	13	F 29
20	E		6	14	5	46	12	G 30
21	F	Matthew Apostle.	6	16	5	44	11	O &c.
22	G	Victor.	6	18	5	42	10	B 2
23	A		6	20	5	40	9	C 3
24	B		6	22	5	38	8	D 4
25	C	Cyprian.	6	24	5	36	7	E 5
26	D		6	26	5	34	6	F 6
27	E		6	28	5	32	5	G 7
28	F		6	30	5	30	4	A 8
29	G	Michael Arch Angel.	6	32	5	28	3	B 9
30	A	Hierome.	6	34	5	26	Prid.	C 10

Astronomicall Calculations, for xix years.

Moneth dayes.	Prime ☌	New Moone and Suns Eclipse.			Digits of Sun Eclipsed.	Prime ☍	Full Moon and her Eclipse.			Digits of Moon Eclipsed.
1						6	4	0	p	
2	10	At Noon.			●					
3						14	6	27	a	
4	18	10	0	p						
5						3	5	43	p	
6	7	1	47	p		11	20	22		
7	15	3	7	a		19	6	17	p	10.1-2
8	4	9	24	a						
9	12	6	0	p		8	1	44	a	
10						16	7	33	p	
11	1	4	14	p						
12						5	1	25	p	
13	9	11	44	a	8.1-3					
14						13	8	8	a	
15	17	4	32	p						
16						2	10	14	a	
17	6	3	25	a		10	7	27	p	
18	14	11	13	a						
19	3	3	4	p		18	2	30	a	
20						7	0	50	p	
21	11	7	30	a		15	6	20	p	
22	19	3	42	p	●					
23						4	0	47	p	
24	8	9	26	a	●					
25						12	3	12	a	
26	16	3	34	a		1	8	0	p	
27	5	11	25	a						
28	13	6	30	p		9	1	51	a	
29						17	3	34	p	
30	2	11	4	a						

October hath xxxi dayes.

Month dayes	Week dayes	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting. h.	m	The Latine Accompt.	Romane Accompt.
1	E		6	36	5	24	Kalend.	D 11
2	F		6	38	5	22	6	E 12
3	G		6	40	5	20	5	F 13
4	A		6	42	5	18	4	G 14
5	B	Faith.	6	44	5	16	3	A 15
6	C		6	46	5	14	Prid.	B 16
7	D		6	48	5	12	Nonas.	C 17
8	E		6	50	5	10	7	D 18
9	F	Denis.	6	52	5	08	6	E 19
10	G		6	54	5	06	5	F 20
11	A		6	56	5	04	4	G 21
12	B		6	58	5	02	3	A 22
13	C		7	00	5	00	Prid.	B 23
14	D		7	02	4	58	Id.	C 24
15	E	Pub. Virgil. *nas. an. Christ.* 67.	7	04	4	56	18	D 25
16	F		7	06	4	54	17	E 26
17	G		7	08	4	52	16	F 27
18	A	Luke Evangelist.	7	10	4	50	15	G 28
19	B		7	12	4	48	14	A 29
20	C		7	14	4	46	13	B 30
21	D		7	15	4	45	12	C 31
22	E	Eras. Rheinhold. *nat. an.* 1511.	7	17	4	43	11	Nov.
23	F	Term begins, *if not Sunday.*	7	19	4	41	10	
24	G		7	20	4	40	9	
25	A		7	22	4	38	8	
26	B		7	24	4	36	7	
27	C		7	26	4	34	6	
28	D	Simon and Jude.	7	28	4	32	5	
29	E		7	30	4	30	4	
30	F		7	32	4	28	3	
31	G		7	33	4	27	Prid.	F 10

Astronomicall Calculations. for xix years.

Month dayes	Prime ☌	New Moon and the Suns Eclips.			Digits of Sun Eclipsed.	Prime ☍	Full Moone, and her Eclips.			Digits of Moo. Eclipse.
1						6	7	13	a.	
2	20	4	5	ꝑ						
3						14	1	33	a	
4	28	1	21	ꝑ	●					
5	7	14	41			3	8	32	a	
6	25	11	43	a		11	7	53	p	
7	4	7	16	p		19	3	24	a	
8						8	11	52	a	●
9	22	5	9	a						
10						16	11	53	a	
11	12	9	22	a						
12						5	7	00	a	
13	29	4	3	a						
14						13	1	00	a	
15	17	5	33	a	●	2	9	5	p	
16	6	1	8	p						
17	24	8	32	p		10	4	43	a	
18						18	1	40	p	
19	13	8	00	a						
20	33	10	52	p		7	2	43	a	7. 3-4
21						15	0	6	p	
22	29	9	3	a						
23	8	12	46	p	●	4	5	22	a	
24						12	7	15	p	
25	26	2	0	p	5. 1-3					
26	5	9	50	p		1	5	13	a	
27						9	0	34	p	
28	23	4	54	a						
29						17	6	53	a	6
30	2	3	38	a		6	12	54	p	
31										

November hath xxx. dayes.

Moneth dayes.	Weeke dayes	Fixed Feasts and Terms, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane Accompt.
1	D	All Saints.	7	34	4	26	Kalends	11
2	E		7	36	4	24	4	12
3	F		7	38	4	22	3	13
4	G		7	39	4	21	Prid.	14
5	A	Powder Treason.	7	40	4	20	Nonas.	15
6	B	Leonard.	7	42	4	18	8	16
7	C		7	43	4	17	7	17
8	D		7	45	4	15	6	18
9	E	*Natalis* Lutheri, 1483.	7	46	4	14	5	19
10	F		7	48	4	12	4	20
11	G	Martine.	7	49	4	11	3	21
12	A		7	50	4	10	Prid.	22
13	B		7	52	4	08	Id	23
14	C		7	53	4	07	18	24
15	D		7	55	4	05	17	25
16	E		7	56	4	04	16	26
17	F	Hugh.	7	57	4	03	15	27
18	G		7	58	4	02	14	28
19	A		7	59	4	01	13	29
20	B	Amos.	8	00	4	00	12	30
21	C		8	01	3	59	11	Dece.
22	D		8	02	3	58	10	2
23	E		8	03	3	57	9	3
24	F		8	04	3	56	8	4
25	G	Katherine.	8	05	3	55	7	5
26	A		8	06	3	54	6	6
27	B		8	06	3	54	5	7
28	C	Term ends.	8	07	3	53	4	8
29	D		8	08	3	52	3	9
30	E	Andrew Apostle.	8	09	3	51	Prid.	10

Astronomicall Calculations, for xix years.

Moneth dayes	Prime ☌	New Moon, and the Suns Eclips:			Digits of Sun Eclipsed.	Prime ☍	Full Moone, and her Eclips:			Digits of Moon Eclipsed.
1						14	3	26	p	
2										
3	18	3	48	a		3	9	38	p	
4	7	3	30	p	7	11	18	40		
5	15	12	33			19	2	4	p	
6	4	6	45	a		8	12	35	p	
7	12	7	15	p						
8										
9						16	6	22	a	20.3-4
10	1	3	54	a						
11	9	8	50	p		5	1	22	a	
12						13	5	28	p	
13	17	3	46	p						
14	6	11	5	p	●	2	7	34	a	
15						10	2	33	p	
16	14	6	15	a						
17	3	11	22	p		18	3	11	a	
18						7	7	46	p	
19	11	4	53	p						
20						15	6	25	a	9.2-3
21	19	1	48	a		4	8	54	p	
22	8	2	56	p						
23	16	11	45	p		12	4	6	a	
24						1	3	25	p	
25	5	7	30	a	●					
26	13	5	40	p		9	0	8	a	
27										
28	2	11	26	p		17	1	32	a	
29						6	6	38	p	
30	10	5	23	p						

December hath xxxj dayes.

Moneth dayes	Weeke dayes	Fixed Feasts and Termes, &c.	Sunne rising. h.	m.	Sunne setting. h.	m.	The Latine accompt.	Romane	Accompt.
1	G		8	10	3	50	Kalend.	B	11
2	A		8	11	3	49	6	C	12
3	B		8	12	3	48	5	D	13
4	C		8	12	3	48	4	E	14
5	D		8	13	3	47	3	F	15
6	E		8	13	3	47	Prid.	G	16
7	F		8	13	3	47	Nonas.	A	17
8	G	*Conception of* Mary.	8	13	3	47	8	B	18
9	A		8	13	3	47	7	C	19
10	B		8	13	3	47	6	D	20
11	C	*The shortest Day*	8	13	3	47	5	E	21
12	D		8	13	3	47	4	F	22
13	E	Lucie.	8	13	3	47	3	G	23
14	F		8	13	3	47	Prid.	A	24
15	G		8	13	3	47	Ides.	B	25
16	A		8	13	3	47	17	C	26
17	B		8	12	3	48	16	D	27
18	C		8	11	3	49	15	E	28
19	D		8	10	3	50	14	F	29
20	E		8	9	3	51	13	G	30
21	F	Thomas Apostle.	8	8	3	52	12	A	31
22	G		8	7	3	53	11	Janu.	
23	A		8	6	3	54	10	B	2
24	B		8	5	3	55	9	C	3
25	C	Christs Nativity.	8	5	3	55	8	D	4
26	D	Stephen.	8	4	3	56	7	E	5
27	E	John Evangelist.	8	4	3	56	6	F	6
28	F	Innocents.	8	3	3	57	5	G	7
29	G		8	3	3	57	4	A	8
30	A		8	2	3	58	3	B	9
31	B		8	2	3	58	Prid.	C	10

Astronomicall Calculations for xix yeares.

Moneth dayes.	Prime ☉	New Moone and the Suns Eclipse.			Digits of Sun Eclipsed.	Prime ☽	Full Moone and her Eclipse.			Digits of Moon Eclipsed.
1						14	2	10	p	
2	18	5	6	p						
3	7	13	42			3	9	36	a	
4	15	9	8	a	●	11	5	9	p	
5	4	8	48	p		19	2	32	a	
6						8	4	7	p	
7	12	0	14	p						
8										
9	1	10	40	p		16	2	40	a	
10						5	6	45	p	4
11	9	5	0	p						
12						13	8	22	a	
13	17	2	24	a		2	5	58	p	
14	6	9	9	a						
15	14	5	47	p	●	10	1	20	a	
16						18	8	43	p	
17	3	5	24	p						
18						7	1	50	p	
19	11	0	25	p		15	10	46	p	
20	19	5	15	p						
21						4	9	54	p	●
22	8	3	2	a		12	7	34	p	
23	16	10	50	a						
24						1	2	37	a	
25	5	15	0			9	1	53	p	
26	13	9	0	a	●					
27						17	8	40	a	
28	2	8	2	p						
29						6	3	10	p	
30	10	11	37	a						
31						14	5	6	a	

An Almanack for XIX. *years, beginning* Anno 1648, *and ending* Anno 1667, *shewing the* Dominicall Letter, Prime, Epact, Moveable Feasts, &c.

The Years of our Lord.	Domin. Lettet.	Prime.	Epact.	Shrove Sunda.	Easter day	Rogation Sunday.	Ascension day.	Whit Sunday.	Advent Sunda
1648	BA	15	15	Feb. 13	Apr. 2	May 7	May 11	May 21	Dec. 3
1649	G	16	26	4	Mar. 25	Apr. 29	03	13	2
1650	F	17	7	24	Apr. 14	May 19	23	June 2	1
1651	E	18	18	9	Mar. 30	4	08	May 18	Nov. 30
1652	DC	19	29	28	Apr. 18	23	27	June 6	28
1653	B	1	11	20	10	15	19	May 29	27
1654	A	2	22	5	Mar. 26	Apr. 30	04	14	Dec. 3
1655	G	3	3	25	Apr. 15	May 20	24	June 3	2
1656	FE	4	14	17	6	11	15	May 25	Nov. 30
1657	D	5	25	8	Mar. 29	3	07	17	29
1658	C	6	6	21	Apr. 11	16	20	30	28
1559	B	7	17	13	3	8	12	22	27
1660	AG	8	28	Mar. 4	22	27	31	June 10	Dec. 2
1661	F	9	9	Feb. 24	14	19	23	2	1
1662	E	10	20	9	Mar. 30	4	08	May 18	Nov. 30
1663	D	11	1	Mar. 1	Apr. 19	24	28	June 7	29
1664	CB	12	12	Feb. 21	10	15	19	May 29	27
1665	A	13	23	5	Mar. 26	Apr. 30	04	14	Dec. 3
1666	G	14	4	25	Apr. 15	May 20	24	June 3	2

The use of this Almanack.

FInde the year of our Lord, in which you would know the Moveable Feasts, in the first column of the Table, and in the subsequent you shall have your desire.

EXAMP. In the year 1649 you will finde the *Dominicall Letter*, G. *Prime* 16. *Epact* 26. *Shrove Sund.* Feb. 4. *Easter day*, Mar 25. *Rogation Sund*, Apr. 29. *&c.*

A neceſſary APPENDIX to the precedent EPHEMERIS.

The Introduction.

BEfore wee come to deliver any particular uſes of the foregoing Ephemeris, it will be neceſſary, as Geographers uſe to doe in ſurveying of ſtrange Countries, firſt to take a generall view of the whole Province, and then make farther ſearch into the parts thereof: wherefore, we will firſt explain the contents of the Ephemeris in a generall way, and afterwards in a more particular, by deſcribing the ſeverall Columnes therein contained.

And for the true underſtanding thereof, you are to take notice that the precedent Ephemeris will ſerve exactly for 19 yeares, beginning *Anno* 1648, and continuing till *Anno* 1667, to finde the time of the Conjunctions and Oppoſitions of the Luminaries, commonly called the New and Full Moons, with all the Eclipſes both Solar and Lunar, exactly calculated for the Meridian of *London*, unto which in the ſucceeding problems, are added exact Rules and Tables for the finding of the true place of the Sun and Moon for ever, that by the help of them the ſaid Ephemeris may be continued to what time you pleaſe.

And

An Almanack for xix. *years, beginning* Anno 1648, *and ending* Anno 1667, *shewing the* Dominicall Letter, Prime, Epact, Moveable Feasts, &c.

The Years of our Lord.	Domin. Letter.	Prime.	Epact.	Shrove Sunda.	Easter day	Rogation Sunday.	Ascension day.	Whit Sunday.	Advent Sunda
1648	BA	15	15	Feb. 13	Apr. 2	May 7	May 11	May 21	Dec. 3
1649	G	16	26	4	Mar. 25	Apr. 29	03	13	2
1650	F	17	7	24	Apr. 14	May 19	23	June 2	1
1651	E	18	18	9	Mar. 30	4	08	May 18	Nov. 30
1652	DC	19	29	28	Apr. 18	23	27	June 6	28
1653	B	1	11	20	10	15	19	May 29	27
1654	A	2	22	5	Mar. 26	Apr. 30	04	14	Dec. 3
1655	G	3	3	25	Apr. 15	May 20	24	June 3	2
1656	FE	4	14	17	6	11	15	May 25	Nov. 30
1657	D	5	25	8	Mar. 29	3	07	17	29
1658	C	6	6	21	Apr. 11	16	20	30	28
1559	B	7	17	13	3	8	12	22	27
1660	AG	8	28	Mar. 4	22	27	31	June 10	Dec. 2
1661	F	9	9	Feb. 24	14	19	23	2	1
1662	E	10	20	9	Mar. 30	4	08	May 18	Nov. 30
1663	D	11	1	Mar. 1	Apr. 19	24	28	June 7	29
1664	CB	12	12	Feb. 21	10	15	19	May 29	27
1665	A	13	23	5	Mar. 26	Apr. 30	04	14	Dec. 3
1666	G	14	4	25	Apr. 15	May 20	24	June 3	2

The use of this Almanack.

FInde the year of our Lord, in which you would know the Moveable Feasts, in the first column of the Table, and in the subsequent you shall have your desire.

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And for the true underſtanding thereof, you are to take notice that the precedent Ephemeris will ſerve exactly for 19 yeares, beginning *Anno* 1648, and continuing till *Anno* 1667, to finde the time of the Conjunctions and Oppoſitions of the Luminaries, commonly called the New and Full Moons, with all the Eclipſes both Solar and Lunar, exactly calculated for the Meridian of *London*, unto which in the ſucceeding problems, are added exact Rules and Tables for the finding of the true place of the Sun and Moon for ever, that by the help of them the ſaid Ephemeris may be continued to what time you pleaſe.

And

And here, by the way, the judicious Reader is deſired to take notice, that the precedent Ephemeris was not calculated from the Aſtronomicall Tables hereafter inſerted, in the 6, 7, 8, and 9, Chapters of this ſecond part, and ſo on, but from the obſervations and Tables of *Tycho*, *Lansberg*, *Argol*, and other, the beſt approved, Uraniſcopers, whoſe Works are extant: And this we have the rather done, not that we miſtruſted the exactneſſe of our own Tables, or the certainty of any concluſions wrought by them, but that the judicious, by comparing the calculations in the Ephemeris, with thoſe examples wrought by our Tables, the exactneſſe and verity thereof may appear.

The Ephemeris conſiſteth of two parts, the one Vulgar, the other Aſtronomicall: We may call the firſt part Vulgar, in reſpect of the ordinary uſe thereof, it being compoſed for the uſe and benefit of all ſorts of people, for it will ſerve for a perpetuall Almanack. And the other part we may call Aſtronomicall, in regard it containeth exact and approved Aſtronomicall Calculations, ſuch as appertain chiefely to the Sun and Moon, as the Conjunctions, Oppoſitions, and Eclipſes thereof.

Having thus given you a generall view of the whole, we will now deſcribe the ſeverall parts, by delivering the contents of every columne in each Moneth contained.

CHAP. I.

☞ *An explanation of the ſeverall Columns contained in each page of the precedent Ephemeris.*

THe Ephemeris conſiſteth of twelve leaves, that is to ſay, of twenty foure pages, each Moneth containing two pages, *viz.* a right and a left, wee call that the right page, which (when the book is opened) lyeth towards the right hand, and that which lyeth towards the left hand, we call the left page: each of which pages are divided into ſeverall columnes, *viz.* the left page into (8) and the right page into (7) in the front or head of each of which columnes, there is the title written, ſhewing the particular contained therein: A briefe view of which followeth.

1. In

1 In the firſt Columne of the left page are placed the dayes of the Moneth, by which may be known how many dayes each Moneth conteineth.

2 In the ſecond Columne of the left page is placed the dayes of the weeke, which are known by the ſeven *Dominicall Letters* attributed thereunto, *viz.*: A, B, C, D, E, F, G. A being placed againſt the firſt day of *January*, and the reſt in their order to the yeares end. And you are to note, that one, or other, of theſe 7 Letters, repreſenteth Sunday every yeare, which Letter, is called the *Dominicall Letter* for that yeare, and againſt whatſoever dayes in the yeare that Letter ſtandeth, all theſe dayes are Sundayes, as if the *Dominicall Letter* were G, then all thoſe dayes in the yeare that have G ſtanding againſt them are Sundayes for that yeare, As for inſtance in the Moneth of *January*, G ſtandeth againſt the 7, the 14, the 21, and 28 dayes: wherefore, all thoſe dayes are Sundayes in the Moneth of *January*, when the *Dominicall Letter* is G. The like is to be underſtood of all the other Moneths, and of the other Letters when they are *Dominicals*, as if D were *Dominicall Letter*, then all the dayes in the yeare that have D ſtanding againſt them, are Sundayes for that whole yeare. Here is to be noted that in the Leape yeare there are two *Dominicall Letters*, the firſt of which is to be employed as *Dominicall Letter* till the 24 of *February*, and the other from thence to the yeares end; as for example, this yeare 1648, the *Dominicall Letters* were B A, the firſt of which *viz.* B, was uſed till the Sunday before the 24 of *February*, and the latter of them, A, from thence to the end of the yeare.

3 In the third is placed the fixed Feaſts yet in uſe, with ſome other intermediate dayes of note, with the beginning and ending of the fixed Termes.

4 In the fourth, is the houre and minute of Sunne riſing at *London*, which doubled is the length of the night.

5 In the fifth, the houre and minute of Sun ſetting: which doubled is the length of the day.

6 The ſixth conteineth the Latine accompt by *Calends*, *Nones* and *Ides*.

7 The ſeventh and eighth Columnes conteine the dayes of the Moneth, and dayes of the weeke, according to the *Romane* accompt, which differeth 10 dayes from the accompt uſed with us, for the firſt day of our Moneth is the 11 of theirs.

Thus much concerning the left page, the right page is divided into seven Columnes, conteining exact Astronomicall Calculations for 19 yeares. The use of which we will shew in the ensuing Chapters.

Chap. II.

To finde the exact time of the new and full Moone.

IN the second row of columne of the Ephemeris, you have the Prime or *Golden Number* for any year, under the title [Prime ☌] and in the same line in the third columne you have the true time of the Conjunction of the Sun and Moon vulgarly called the new Moon.

Example. This present year 1648, I desire to know the time of the Moons change in the moneth of *March*: having found the *Golden Number*, by the first or seventh Chapt. of the first Part, to be 15, I finde 15 in the second columne of the right page of the *Ephemeris*, under the title [Prime ☌ to stand against the 14 day of the moneth, and in the third columne enticuled [*New Moone*] I finde against the Prime 15. This number 6. 44. A. which is 6 of the clock and 44 minutes before noone, which is the true time that the Moon will change in the moneth of *March* 1648.

In the same manner, may the time of the Opposition or full Moon be found, by finding the Prime or *Golden Number* in the 5 columne of the right page of the *Ephemeris* under the title [Prime ☍] and in the 6 columne, against the same, you have the true time of the Opposition or full Moon.

EXAMPLE. In the fore-mentioned yeare and moneth, I would know the time of the full Moon exactly, having ſought the *Prime* or *Golden Number* for that yeare (which is 15) in the 5 Columne of the right page of the *Ephemeris*, I find it to ſtand againſt the 28 day of the Moneth, and in the ſame line of the next Columne, under the title [*Full Moone*] I finde this number 1, 20, P, which ſheweth, that it is full Moon on the 28 day, 1 houre, and 20 minutes after noone, that is, at 1 of the clocke, and 20 minutes after noone: for in theſe Tables you are to note, that if you finde the letter A affixed, the time of the New or full Moon is *Ante*, or before noon, but if you finde the letter P affixed, it is *Poſt*, or after noone.

CHAP. III.

To finde the Eclipſes of the Sun and Moone, and to know when they ſhall happen, and the quantity of obſcuration.

HAving found the time of the new, or full Mone, by the foregoing inſtructions, obſerve whether there ſtand againſt the ſame any Figures, or ſuch a marke as this ● under the title [*Digits*] if ſo, then you may conclude, there is an *Eclipſe*, if no Marke, nor Figure, then be ſure there is no Eclipſe at that time.

Thoſe New, or Full Moones that have Arithmeticall Figures ſet againſt them in the row, under title [*Digits*] denote that the *Luminary* at that preſent will be *Eclipſed*: So many *Digits*, as the figure repreſents, to be ſeene here in *England*. But whereſoever this Marke ● is found, it ſhewes there is an *Eclipſe*, but not to be ſeene.

EXAMPLE. In *November* 1648. I finde (according to the former Directions) that the Full Moone happens on the 20 day at 5 ho. 25 min. in the Morning. Now againſt the ſame, under the title [*Digits* ☉] ſtands 9.2-3 which tells me the Moon will then be Eclipſed 9 *Digits*, and about 2 third parts of a *Digit*.

Againe, in *June*, *anno prædicto*, I finde the New Moon falls on the 10 day at 12 houres, 34 min. afternoon, againſt which, under the title *Digits* ☉] is found this Marke, ● ſignifying the Sun is then *Eclipſed*, but cannot be ſeen in *England*.

Chap. IV.

Of the Eclipſe of the Sun, what it is, and when it chanceth.

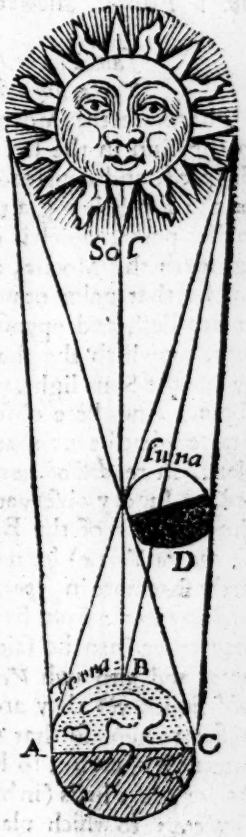
THe Eclipſe of the *Sun* is nothing elſe but the direct interpoſi-on of the body of the Moon betweene our ſight and the Sun, for the Moon being a denſe, ſolid, and opacuous body, and not tranſparent, comming betwixt the Sunne and the Earth, (which is alwayes in a Conjunction) doth thereby hide more or leſſe of the Sunnes bright ſhining body from our ſight; but yet the Sun is not Eclipſed in every Conjunction, but when it falleth in, or neere to the head or taile of the Dragon. And it may ſome-time ſo fall out, that the Sun may ſuffer two totall and centrall Eclipſes, in the ſpace of ſixe Moneths, one of which happening before the Suns *Apogæon*, and the other after, in which caſe there may happen no full Moone Eclipſed that yeare; according to the Rule: *Fieri poteſt ut duo interlunia nodis proxima, & ferè centralia, unius ſemeſtris intervallo accidat: Unum quidem ante Solis* Apogæum, *alterum poſt illud; quo caſu intra totum annum Lunarem nullum continget plenilunium eclipticum.* But it cannot be univerſall (as the Moons Eclipſe is) but may appeare in one Climate a great Eclipſe, in another it may be leſſer, and in otherſome no Eclipſe at all, and that at the ſelfeſame inſtant, becauſe the Eclipſe of the Sun dependeth principally on the parallax of the Moon, which is different in every Climate, (as hereafter, God willing in an other Work) and ſeeing that the Sun farre exceedeth the Earth in bigneſſe, and the Earth farre exceedeth the Moon, therefore the *Cone* of the Earths ſhaddow, cannot take away: or hide the whole body of the Sun from all parts of the Earth, but one part onely ſhall obſerve the ſame to be totall, or of like quantity. Hence it may appeare that the Sunne loſeth no light, but onely we are deprived of the ſame, by the interpoſition of the Moons terreneall body (as is ſaid before) and therefore Aſtronomers define, that it is *Interceptio luminis Solaris profecta, ex interpoſitu Lunæ inter Solem atque aſpectum noſtrum.* So that *Suidas* well obſerves, that *Solis eclipſis fit, quando Luna in ipſum incurrit.* And for the better underſtanding of what is ſaid, behold this Figure following.

A Tyte

A Type of the Suns Eclipſe.

BY this Type it appeares, that to him that ſtands in *C*, the whole body of the Sun is hidden from his ſight; to him that ſtands in *B*, halfe the Sun is onely hidden; but to him that dwelleth in *A*, there is no part of the Sun hid from his ſight.

Now there are ſome that think, that in the ſpace of 19 yeares all the *Lunations* and *Eclipſes* returne againe to their old Courſe, and happen the ſame againe, and of this opinion is *Plinie* in the 2 *Booke*, 13 *Chap.* of his *Naturall Hiſtory*, where he ſayes, *Elapſis ducentis viginti duobus menſibus Eclipſes in orbes ſuos redire.* Now, ſome there be, who ſay that *Plinies* meaning was, that all the variety of *Eclipſes* are finiſhed in that ſpace of time. But this is but an idle gloſſe. For albeit in the ſame ſpace of time, the head of the *Dragon* goeth once about the *Zodiack*, and the *Eclipſes* thereby may happen neer the ſame time and place againe, yet notwithſtanding they are not therefore the ſame, that is to ſay, of the ſame quantitie and duration; for certaine is the Rule: *Cœli motus inter ſe ſunt incommenſurabiles, nec unquam phœnomena eodem prorſus modo recurrere poſſunt.*



Chap. V.

Of the Eclipſe of the Moon, *what it is, and when it chanceth.*

THe Moon having no light but what ſhe receiveth of the Sun, can never be Eclipſed but at the Full, yet not at every Full, but when ſhee is diametrically oppoſite to the Sun, and the

Earth, in the midst between them both: Hence the *Philosopher* rightly defineth it, that it is, *Privatio Luminis in Luna, orta à diametrali terræ inter Solem & Lunam oppositione*. And *Lucan* also, *Lib.* 1 *Pharsal.* Sheweth the cause of the Moones Eclipse.

——— *cornúque coacto,*
Jam Phœbe toto Fratrem cum redderet orbe
Terrarum subita percussa, expaluit umbra.

Therefore the Moone being full of light, and exactly opposite to the Sun in the head or taile of the Dragon, may be totally Eclipsed, and deprived of light by the shaddow of the Earth; for the Earth being a thick and solid body, cast th its shaddow to that point, which is opposite to the Sun (whom it is that enlightneth the Moone, and all the ætheriall Region, (*suo lumine*) unlesse that point opposite to him.) When therefore the Moone at her Full, and opposition to the Sun, entreth into that obscure part, on which the shaddow of the earth falleth, shee doth thereby lose the Suns light, and is obscure and dark, which we call an Eclipse. And here observe and bee assured, that there is no Starre whatsoever that can enter this shaddow, but the Moone alone, in regard of her propinquity to the Earth, for it is gathered by sundry observations made by the best Astronomers, that the shaddow of the Earth is *Conicall*, the quantity of the extent (*à centro Terræ*) being 250 *Semidiameters*, and the Moon being farthest remote in *Apogæo*, is distant from the Earth but 58 *Semidiameters*: from hence therefore it appeares, that the Moone may enter into the said shaddow, but not any of the other Planets, and although *Venus* and *Mercurie* are sometime within the said limits, yet they are alwayes nigh the Sun, and are never opposite to him, so that this massie Globe of the Earth can never interpose thereby, to hide the Suns glorious beames from them; As for *Mars* he is (in his meane motion) from the earth 1745 *Semidiameters*, to which place the *Cone* of the Earths shaddow never extendeth. And although the Moone is opposite to the Snn every Moneth, she is not therefore Eclipsed in every Opposition, but then onely when at the Opposition she is found in or neere the Ecliptique, having then little or no latitude. Moreover, the *Astronomers* (the better to measure the quantity of the Eclipse) doe divide the Diameter aswell of the Sun, as of the Moone, into 12 equall parts, which they call points, or Digits, and the more Digits the Eclipse is, the greater is the Eclipse: Yet in the Eclipses of the Moone we must know that the Diameter of the shaddow

is

is farre greater then the Diameter of the Moone; hence the Moone being in the middle of the ſaid ſhaddow, which anſwereth the line of the Ecliptique exactly, the whole body of the Moone is not onely obſcured 12 Digits, but the Obſcuration is enlarged much, by the plunging (as it were) of the Moon into the ſaid darke ſhaddow, and her long continuance there; and therefore in *Lunar* Eclipſes, we reckon the number of Digits, according to the quantity of the ſhaddow of the Earth, which may ſometime extend to almoſt 23 Digits.

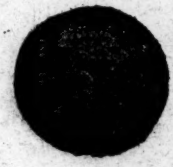
Wherefore we uſually reckon 3 ſorts of Eclipſes, The firſt partiall, when her whole body is not all darkened, but ſome part thereof. The 2 when her whole body is darkned exactly, and this is called a totall Eclipſe, but without continuance. The 3 when ſhe happens into the ſhaddow of the Earth more then 12 Digits, and this is called a totall Eclipſe, with continuance, or ſtay in darkneſſe: All the difference whereof ariſeth principally from the latitude of the Moon, and her diſtance from the Ecliptique line. But of theſe things (*Deo permittente*) more amply hereafter in another Worke.

In this *Diagrame* you may obſerve when the Eclipſe is totall, when partill, and when there is none at all in the Oppoſition.

A Type of the Moones Eclipſe.

Figures

Figures *or* Types *of all the* Eclipses *of the* Moone, *with the time of their beginnings, under the Meridian of* London, *serving from* Anno Dom. 1648 usque ad Annum Dom. 1667, *exactly calculated.*

1648			1649			1649		
Day	houre	Min.	Day	houre	min.	Day	houre	min.
20	4	44 a	16	2	22 a	8	4	37 a
Novemb.			*May.*			*Novemb.*		
1650			1650			1652		
Day	houre	min.	Day	houre	min.	Day	houre	min.
5	6	50 p	28	17	41 p	14	13	47 p
May			*October*			*March*		
1652			1653			1654		
day	houre	min.	day	houre	min.	day	houre	min.
7	4	39 p.	3	14	2 p.	17	9	55 p.
Septemb.			*March*			*August*		
								

1656	1657	1657
Day houre Min.	Day houre min.	Day houre min.
1 7 3 p	15 7 0 p	10 5 38 p
January	*June.*	*Decemb.*

1659	1659	1661
Day houre min.	Day houre min.	Day houre min.
26 5 12 p	9 11 14 p	28 1 27 a
April	*October*	*Septemb.*

1663	1663	1665
day houre min.	day houre min.	day houre min.
12 2 10 a.	8 6 0 p	21 4 47 a.
February.	*Auguſt*	*January*

The ſame year, 1665, will produce another Eclipſe of the Moon on the 16 of *July*, at 12 ho. 26 min., P.M. but in regard that the obſcuration will only containe the 6 part of one *Digit*, to adde the Type thereof were ſuperfluous. Note that the letter A ſtands for *ante*, before noone, and P for *poſt*, after noone, but where you finde in this Table (or in the *Ephemeris*) more houres then 12, it denotes that the Eclipſe, or Aſpect, happens ſo long after noone upon that day they are notified.

Exact Types of all the Eclipses of the Sun that will be visible in *England*, *ab Anno Dom.* 1648, *usquè ad Annum* 1667, exactly calculated.

1649			1652			1654		
day	houre	min	day	houre	min.	day	houre	min.
25	1	49 p	29	9	50 a	2	9	0 a
October.			*March.*			*August.*		

1655			1656			1659		
day	houre	min.	day	houre	min	day	houre	min.
27	2	5 p	16	1	45 p	4	3	30p
January.			*January.*			*Novemb.*		

1661			1666		
day	houre	min.	day	houre	min.
13	11	44 a	22	6	14 a
Septemb.			*June.*		

This Eclipse of the Sun that happeeth the 22 of *June* 1666, will appear almost totall at *Rome*, here in *England* it will not be 8 Digits, and in *Ireland*, it will not be full halfe obscured: and all this is caused by the Moons parallax.

The

The Figures of the Solar Eclipſes here deſcibed, differ much from the Calculation of *Origan*, *Argoll*, and *Eichſtad.* eſpecially the firſt great one, *Anno* 1652, where the difference is ſenſible, for according to *Argols* Ephemerides, the Digits are 7 and 54 minutes, according to *Origans* 8 and 21 min. and here according to our Calculation it is above 11 Digets, and the light that appeares will be on the North ſide the Suns body (*idque ex Tab: Lanshergianis*) whereas according to both the aforeſaid Authors, that light which he will retaine at the middle of the Eclipſe, will be on the South ſide, and though there be ſo great difference, yet it ariſeth not from any errour, either in the Art, or Artiſt, but from the Parallax of the Moone, which differeth both for time and place, as a little before is ſhewed.

As concerning the effects portended by theſe Solar Eclipſes, much might be ſaid, were the Volume fit for that diſcourſe, but herein at preſent we ſhall be briefe, leaving it to be more fully handled elſewhere, onely this by the way, it is manifeſt, and even experience in all ages hath infallibly taught us, that Eclipſes have their influences and operations, and have alwaies been attended with ſome notable *Events* and *Sequels*. *In genere fida experientia* Philſophos *&* Aſtrologos *docuit, Eclipſes in natura habere ſuas cauſas, & ſimul eſſe ſigna pœnarum.* Which we have ſeene plentifully fulfilled in our time, to the great terrour and amazement of this Kingdome, and others conterminate. Doe but peruſe the writings of the *Aſtrologers*, and you ſhall finde that Eclipſes have great influences, though ſome (voyd of Art) have thought the contrary, but *Meſſahalah* in his 7 Booke *de rebus Eclipſium*, tells them this leſſon. *Sito quòd in Eclipſi non poteſt fieri, quin ſignificetur magnum aliquod accidens, ſecundum quantitatem ipſius Eclipſis.* Or elſe let them peruſe *Ptolomie*, *Albumſar*, *Functine*, *Cardane*, *Origan*, *Eichſtade*, *Argol*, and ſundry others. Doe but ſee what *Leovitius* ſaith in his Book *de Eclipſibus. Eclipſes enim Solis præſertim cum plurimum obtenebratur, non leves ac tenues, ſed ſemper atroces funeſtos, & tragicos exitus afferre ſolent, Vt ait* Leovitius *in Prædictione Aſtrologica ſuper Eclipſin Solaris* 1567. Did there not appeare a great Eclipſe of the Sun 1639, and was not *Mars* Lord of the ſame? and did there not happen many other *Lunar* ones ſince, and another *Solar* in *An.* 1645? moſt of them happening in the 8 Houſe, termed of Aſtrologers, *Domus mortis*, the houſe of death, *Mars* being for the moſt part predominate in the ſaid Eclipſes; Surely, if we would but obſerve the hand of God, we may ſee, that in all Ages he forewarnes us by his Inſtruments,

but we like ſtiff-necked people nothing regard Gods handy works, and though his judgements have a long time been in the Land, and great calamities ſeeme ſtill to impend, and hang over us, yet none truely amends, nor condoles our unhappy differences, but ſtill covet for thoſe things that periſh. *O utinam tandem poſt diuturnas diſceptationes, ac longas perturbationes concordia in religione fiat. Sed ita comparatum eſt, ut Zizania cum tritico uſque ad diem meſſis creſcant. Semper enim Eccleſia fuit expoſita gravibus procellis, eritque donec ille ſupremus judex ac juſtus arbiter venerit, qui Zizaniis funditus extirpatis, triticum ſuum colliget, & omnes fideles in unitate congregabit, ubi unus paſtor, & unum ovile erit.*

The precedent Tables being exactly calculated for 19 yeares, we will in the ſubſequent Chapters of this ſecond part, ſhew how to calculate the true places and motions of the two great Luminaries, *viz.* the Sun and Moon, for 60 yeares, and by conſequence for ever, the particulars whereof have not been treated of in our *Engliſh* tongue; wherefore as followeth.

Chap. VI.

To calculate the true place of the Sun.

Firſt, by the Table entituled [*A Table of the middle motion of the Sun in yeares,*] compute the meane, motion of the Sun, and his *Apogæum*, to the time given, by adding the numbers belonging to the yeare, moneth, and day, into one ſumme, then ſubſtract the Suns *Apogæum* from his meane *Longitude*, and the Remainder ſhall be the *Anomalia* of the Sun: with which enter the Table of the Suns Æquation, entituled on the head [*A Table of the æquation of the Sun reſolved*] with the *Signe* on the head, and the *Degrees* in the firſt Columne on the left hand, or if you find not the *Sign* there; but at the bottome of the Table, then take the *Degree* in the firſt Columne on the right hand, and in the *Area* or common angle, you ſhall have the abſolute *Æquation* of the Sun to be added to, or ſubſtracted from the meane motion of the Sun, (as the Titles in the head or foot of the Table doth ſhew) ſo ſhall you have the true motion of the Sun, *ab Æquinoctio vero*, for in theſe Tables the Suns meane motion is reckoned from the true Æquinox, and not from the meane.

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An Example for finding the true place of the Sun the 10 *day of* April 1649, *at noone.*

In the firſt Table following, (entituled, *A Table of the middle motion of the Sun*) in the firſt Columne thereof towards the left hand, finde the yeare propoſed, *viz.* 1649, and in the ſecond Columne, under the Title, *Longitude of the Sun*, againſt 1649, you have 9 20 21 24 which is 9 Signes, 20 Degrees, 21 Minutes, 24 Seconds, which muſt be noted down, as in the following Example; then likwiſe in the third Columne of the ſame Table, againſt 1649, and under the Title, The *Apogæum of the Sun*, you ſhall finde 3 6 33 23 which is, as before, 3 *Signes*, 6 *Degrees*, 33 *Minutes*, 23 *Seconds*, which muſt be noted downe on the leſt hand of the *Longitude of the Sun*, as in the following worke. Then in the ſecond Table, entituled, *A Table of the middle motion of the Sun in Moneths*: finde the Moneth propoſed (*viz. April*) in the firſt Columne (of the ſecond of the Tables of Moneths, if the yeare propoſed be *Biſſextile*, or in the firſt of the Tables of Moneths, if it be a common yeare) now becauſe the yeare propoſed 649 is not *Biſſextile*, I ſeeke *April* in the firſt Table of Moneths, and againſt it, in the ſecond Columne, I finde 2 *Signes*, 28 *Degrees*, 42 *Minutes*, 30 *Seconds*, for the Longitude, and in the third Columne, I finde 15 *Seconds* for the *Apogæum*, which muſt be placed one by the other, as in the following work: Then in the third Table entituled, *A table of the middle motion of the Sun in dayes*, finde the dayes of the Moneths propoſed in the firſt Columne, and the *Longitude* and *Apogæum* of the Sun, in the ſecond and third Columnes of the ſame Table, as you did with the yeare, and moneth, and note them down, as in the following work. Likewiſe if you have any houres or minutes in your times given, they muſt be taken out of the fourth Table entituled, *A Table of the middle motion of the Sun, in houres and minutes*, as the moneths, and dayes were, and as is done in the ſecond Example: then draw a line, and adde theſe together in two ſummes, *viz.* the *Apogæum* of the Sun in one ſumme, and the *Longitude* in another, (allowing 60 *ſeconds* to a *minute*, 60 *minutes* to a *degree*, and 30 *degrees* to a *Signe*,) ſo will the meane *Longitude* of the Sunne be, 0 *Signe*, 28 *degrees*, 55 *minutes*, and 17 *ſeconds*, and the meane *Apogæum* of the Sunne will be 3 *Signes*, 6 *degrees*, 33 *minutes*, 40 *ſeconds*, which muſt alwayes (in finding the place of the Sunne) be ſubſtracted from the *Longitude* of the Sunne, though the *Apogæum* be leſſe then the *Longitude*, which if it be (as in this example it is, for

the

the *Longitude* is 0 *Signe* and the *Apogeum* is 3 *Signes*, now because 3 cannot be taken out of nothing) we must adde 12 *Signes*, (which is a whole circle) to the *Longitude*, and then the *Apogæum* being substracted there-from, the remainder will be 9 *Signes*, 22 *degrees*, 21 *minutes*, 37 *seconds*, which is the *Anomalie* of the Sun: with this *Anomalie* of the Sun you must enter the fifth Table, entituled *A Table of the Æquation of the Sun resolv'd*, finding the *Signes* (if they be under 6) in the head of the Table, and the *degrees* in the first Columne towards the right hand, and in the common angle or meeting of these two lines, you shall have the *Æquation* to be substracted from the mean *Longitude* of the Sun, and the remainder will be the true place of the Sun. But if the *Anomalie* of the Sun be more then 6 *Signes*, (as in this Example it is, *viz.* 9 *Signes*) you must finde the *Signes* in the foot of the Table, & the *degrees* in the first Column, & in the intersection of these two lines you shall finde the *Æquation*, *viz.* 1 *degree*, 52 *min.* 10 *seconds*, to be added to the meane *Longitude* of the Sun, and the summe of them is the true place of the Sun, *viz.* 1 *Signe*, 0 *degree* 47 *minutes*, 27 *seconds*, that is, 0 *degrees*, 47 *minutes*, 27 *seconds* of ♊.

Now if you finde not the minutes in the Table of *Æquation*, you must worke by proportion, so shall you have your desire.

The operation of the precedent Example.

	Longitude of ☉				Apogeum of ☉				
	S	D	′	″	S	D	′	″	
Year proposed, 1649	9	20	21	24	3	06	33	23	
Aprill	2	28	42	30				15	
day 10	0	09	51	23				02	
Middle Longit. of ☉	0	28	55	17	3	06	33	40	Apogæũ of ☉
Apogæum substract.	3	06	33	40					
Remains Anomalie	9	22	21	37					
The Æquation to be added to the middle Longitu.	0	01	52	10					
					D	′	″		
The ☉ true place.	1	00	47	27	in	0	47	27	♊

An

Another Example for practice, to finde the true place of the Sun, October 18, 1649, *at* 6 houres 30 minutes *after Noon.*

☉	Longitude of ☉ S	D	′	″	Apogæum of ☉ S	D	′	″	
Year proposed, 1649	9	20	21	24	3	06	33	23	
October	8	29	04	54				46	
day 18	0	17	44	30				03	
houres 6	0	00	14	47					
minutes 30	0	00	01	14					
Middle Longit. of ☉	7	07	26	49	3	06	34	12	Apogæum of ☉
Apogæum substract.	3	06	34	12					
Remains Anomalie	4	06	52	37					
The Æquatiõ to be substracted from the middle Lon.	6	01	47	20					
					D	′	″		
The ☉ true place.	7	05	39	29	in ♌	5	39	29	♌

These 2 Examples being well understood the Suns true place may be found exactly for any time: and with as great facility as by any Tables yet extant in any Language. In the explanation whereof we have been the larger that the Reader may understand the manner of operation the better, and that the subsequent propositions (some whereof depend on this) may be passed over with the lesse impediment.

Tables of the middle motion and Æquation of the Sun.

A TABLE of the middle motion of the Sunne in Yeares.

Yeares of the Christian Æra.	The Longitude of ☉				The Apogeum of ☉			
	S	D	′	″	S	D	′	″
♋1640	9	19	32	39	3	6	24	10
1641	9	20	17	30	3	6	25	12
1642	9	20	3	11	3	6	26	13
1643	9	19	48	54	3	6	27	15
♋1644	9	19	34	37	3	6	28	16
1645	9	20	19	27	3	6	29	17
1646	9	20	5	9	3	6	30	19
1647	9	19	50	52	3	6	31	20
♋1648	9	19	36	33	3	6	32	21
1649	9	20	21	24	3	6	33	23
1650	9	20	7	7	3	6	34	24
1651	9	19	52	50	3	6	35	26
♋1652	9	19	38	32	3	6	36	27
1653	9	20	23	22	3	6	37	29
1654	9	20	9	5	3	6	38	30
1655	9	19	54	48	3	6	39	31
♋1656	9	19	40	29	3	6	40	32
1657	9	20	25	20	3	6	41	34
1658	9	20	11	3	3	6	42	35
1659	9	19	56	46	3	6	43	36
♋1660	9	19	42	28	3	6	44	38
1661	9	20	27	18	3	6	45	39
1662	9	20	13	1	3	6	46	40
1663	9	19	58	44	3	6	47	42
♋1664	9	19	44	25	3	6	48	43
1665	9	20	29	16	3	6	49	44
1666	9	20	14	59	3	6	50	46
1667	9	20	00	42	3	6	51	47
♋1668	9	19	46	24	3	6	52	48
1669	9	20	31	15	3	6	53	50
1670	9	20	16	58	3	6	54	51
1671	9	20	2	40	3	6	55	52

Yeares of the Christian Æra.	The Longitude of ☉				The Apogeum of ☉			
	S	D	′	″	S	D	′	″
♋1672	9	19	48	22	3	6	56	54
1673	9	20	33	13	3	6	57	55
1674	9	20	18	56	3	6	58	56
1675	9	20	4	38	3	6	59	58
♋1676	9	19	50	20	3	7	00	59
1677	9	20	35	11	3	7	2	0
1678	9	20	20	54	3	7	3	2
1679	9	20	6	35	3	7	4	3
♋1680	9	19	52	18	3	7	5	4
1681	9	20	37	9	3	7	6	6
1682	9	20	22	52	3	7	7	7
1683	9	20	8	33	3	7	8	8
♋1684	9	19	54	16	3	7	9	10
1685	9	20	39	7	3	7	10	11
1686	9	20	24	50	3	7	11	12
1687	9	20	10	33	3	7	12	14
♋1688	9	19	56	16	3	7	13	15
1689	9	20	41	4	3	7	14	16
1690	9	20	26	47	3	7	15	18
1691	9	20	12	29	3	7	16	19
♋1692	9	19	58	12	3	7	17	20
1693	9	20	43	2	3	7	18	22
1694	9	20	28	45	3	7	19	23
1695	9	20	14	27	3	7	20	24
♋1696	9	20	00	9	3	7	21	26
1697	9	20	44	59	3	7	22	27
1698	9	20	30	42	3	7	23	28
1699	9	20	16	24	3	7	24	30
♋1700	9	20	2	6	3	7	25	31

A Table of the middle motion of ☉, in Moneths of the cõmon Year.

Moneths of the Common Yeare.	*The* Longitude *of the* ☉. Sign.	De.	′	″	*The* Apogæum *of the* ☉. Sign.	Deg.	′	″
January.	00	00	00	00	00	00	00	00
Febʒuary.	01	00	33	18	00	00	00	05
March.	01	28	09	11	00	00	00	10
Aprill.	02	28	42	30	00	00	00	15
May.	03	28	16	40	00	00	00	20
June.	04	28	49	58	00	00	00	25
July.	05	28	24	07	00	00	00	30
August.	06	28	57	26	00	00	00	35
September.	07	29	30	44	00	00	00	40
October.	08	29	04	54	00	00	00	46
November.	09	29	38	12	00	00	00	51
December.	10	29	12	22	00	00	00	56

A Table of the middle motiõ of ☉, in moneths of the *Bissextile* Year.

Moneths of the Bissextile Year.	*The* Longitude *of the* ☉. Sign.	Deg.	′	″	*The* Apogæum *of the* ☉. Sign.	Deg.	′	″
January.	00	00	00	00	00	00	00	00
Febʒuary.	01	00	33	18	00	00	00	05
March.	01	29	08	19	00	00	00	10
Aprill.	02	29	41	38	00	00	00	15
May.	03	29	15	48	00	00	00	20
June.	04	29	49	06	00	00	00	25
July.	05	29	23	15	00	00	00	30
August.	06	29	56	34	00	00	00	35
September.	08	00	29	52	00	00	00	41
October.	09	00	04	02	00	00	00	46
November.	10	00	37	20	00	00	00	51
December.	11	00	11	30	00	00	00	56

A Table of the middle motion of the ☉ in dayes.

Dayes	Longit. of the ☉ S	D	′	″	Apogæ of ☉ ″
1	0	0	59	08	0
2	0	1	58	17	0
3	0	2	57	25	0
4	0	3	56	33	1
5	0	4	55	42	1
6	0	5	54	50	1
7	0	6	53	58	1
8	0	7	53	07	1
9	0	8	52	15	2
10	0	9	51	23	2
11	0	10	50	32	2
12	0	11	49	40	2
13	0	12	48	48	2
14	0	13	47	57	2
15	0	14	47	05	3
16	0	15	46	13	3
17	0	16	45	22	3
18	0	17	44	30	3
19	0	18	43	38	3
20	0	19	42	47	3
21	0	20	41	55	4
22	0	21	41	03	4
23	0	22	40	12	4
24	0	23	39	20	4
25	0	24	38	28	4
26	0	25	37	37	4
27	0	26	36	45	5
28	0	27	35	53	5
29	0	28	35	02	5
30	0	29	34	10	5
31	1	00	33	18	5

A Table of the middle motion of the Sun in Houres & minutes.

Houres	Longit. of ☉ D	′	″	Houres	Longit. of ☉ D	′	″
1	0	2	28	31	1	16	23
2	0	4	56	32	1	18	51
3	0	7	24	33	1	21	19
4	0	9	51	34	1	23	47
5	0	12	19	35	1	26	15
6	0	14	47	36	1	28	43
7	0	17	15	37	1	31	11
8	0	19	43	38	1	33	39
9	0	22	11	39	1	36	6
10	0	24	38	40	1	38	34
11	0	27	6	41	1	41	3
12	0	29	34	42	1	43	31
13	0	32	2	43	1	45	59
14	0	34	30	44	1	48	26
15	0	36	58	45	1	50	54
16	0	39	25	46	1	53	21
17	0	41	53	47	1	55	49
18	0	44	21	48	1	58	17
19	0	46	49	49	2	0	44
20	0	49	17	50	2	3	12
21	0	51	45	51	2	5	40
22	0	54	12	52	2	8	8
23	0	56	40	53	2	10	36
24	0	59	8	54	2	13	3
25	1	1	36	55	2	15	31
26	1	4	4	56	2	17	59
27	1	6	32	57	2	20	27
28	1	9	00	58	2	22	55
29	1	11	27	59	2	25	23
30	1	13	55	60	2	27	50
minutes	′	″	‴	minutes	′	″	‴

A TABLE of the Æquation of the Sunne resolv'd.

Anomal. ☉ D	Signe-0 substract D	′	″	Signe-1 substract D	′	″	Signe-2 substract D	′	″	Signe-3 substract D	′	″	Signe-4 substract D	′	″	Signe-5 substract D	′	″	Anomal. ☉ D
0	0	0	0	0	59	37	1	44	35	2	2	54	1	48	22	1	3	26	30
1	0	2	5	1	1	26	1	45	41	2	2	58	1	47	20	1	1	33	29
2	0	4	9	1	3	14	1	46	45	2	2	59	1	46	15	0	59	38	28
3	0	6	13	1	5	1	1	47	47	2	2	58	1	45	7	0	57	42	27
4	0	8	17	1	6	47	1	48	47	2	2	55	1	43	58	0	55	44	26
5	0	10	21	1	8	31	1	49	46	2	2	50	1	42	47	0	53	44	25
6	0	12	24	1	10	14	1	50	43	2	2	41	1	41	34	0	51	43	24
7	0	14	28	1	11	56	1	51	38	2	2	31	1	40	18	0	49	41	23
8	0	16	31	1	13	36	1	52	29	2	2	19	1	39	00	0	47	38	22
9	0	18	34	1	15	15	1	53	18	2	2	4	1	37	42	0	45	35	21
10	0	20	37	1	16	54	1	54	5	2	1	47	1	36	22	0	43	31	20
11	0	22	40	1	18	31	1	54	53	2	1	28	1	34	59	0	41	26	19
12	0	24	42	1	20	7	1	55	39	2	1	7	1	33	26	0	39	20	18
13	0	26	43	1	21	41	1	56	22	2	0	43	1	32	10	0	37	13	17
14	0	28	44	1	23	14	1	57	1	2	0	17	1	30	42	0	35	5	16
15	0	30	44	1	24	47	1	57	39	1	59	49	1	29	10	0	32	58	15
16	0	32	45	1	26	18	1	58	15	1	59	13	1	27	38	0	30	48	14
17	0	34	45	1	27	47	1	58	48	1	58	47	1	26	4	0	28	38	13
18	0	36	44	1	29	14	1	59	20	1	58	12	1	24	28	0	26	28	12
19	0	38	43	1	30	40	1	59	50	1	57	35	1	22	31	0	24	18	11
20	0	40	41	1	32	4	2	0	18	1	56	46	1	21	13	0	22	7	10
21	0	42	38	1	33	27	2	0	44	1	56	14	1	19	34	0	19	55	9
22	0	44	34	1	34	48	2	1	8	1	55	31	1	17	54	0	17	44	8
23	0	46	30	1	36	8	2	1	29	1	54	46	1	16	12	0	15	32	7
24	0	48	25	1	37	26	2	1	48	1	53	56	1	14	27	0	13	20	6
25	0	50	19	1	38	41	2	2	4	1	53	9	1	12	39	0	11	7	5
26	0	52	12	1	39	55	2	2	18	1	52	16	1	10	51	0	8	53	4
27	0	54	5	1	41	8	2	2	30	1	51	20	1	9	1	0	6	40	3
28	0	55	58	1	42	18	2	2	40	1	50	22	1	7	11	0	4	27	2
29	0	57	48	1	43	27	2	2	48	1	49	23	1	5	19	0	2	13	1
30	0	59	37	1	44	35	2	2	54	1	48	22	1	3	26				0
	Adde			*Adde*			*Adde*			*Adde*			*Adde*			*Adde*			
	Sign-11			Sign-10			Signe-9			Signe-8			Signe 7			Signe-6			

CHAP. VII.

To Calculate the true place of the Moon in Longitude.

THe Calculation of the true motion of the Moone in Longitude, differs so little from the Calculation of the true motion of the Sun, that he that knowes the one, cannot bee ignorant of the other, as may appeare by the manner of the Calculation here following.

Having found the meane motion of the Sun, by the precedent Chapter, with the meane motion of the Moone, and her *Anomalie* to the time desired by these Tables: enter the Table of the *Moones Æquation*, entituled, [*A Table of the Æquation of the Moone resolv'd.*] Finding the distance of the Moone from the Sun in the head of the Table, if it be lesse then 3 Signes; and the *Anomalie* in the first Columne on the left hand: but enter in the foot of the Table, if the distance of the Moone, from the Sun be more then 3 Signes, and with the *Anomalie* in the first Columne on the right hand, and in the angle, or place of meeting, you shall have the true *Æquation* of the Moone, to be added to, or substracted from, the meane distance of the Moone from the Sun (as the words *Adde* and *Substract* shew:) So shall you have the true *Longitude* of the Moone, if you adde the Suns meane *Longitude* thereunto. But if in the Table you cannot finde the just distance of the Moon from the Sun, neither the *Anomalie* exactly, then take the proportionall part, and the absolute *Æquation* will emerge; and here observe, that whensoever the distance of the Moone from the Sun shall be greater then 6 Signes, you are to deduct 6 Signes there-from, and the residue shall be the distance of the Moon from the ☍ Opposition of the Sun, with which you are to enter the Table as before.

An Example *to finde the true place of the* ☾, Aprill 10, 1649, *at noon.*

	Longi. of the ☾ frō the ☉				Anomalie of the ☾			
	☽	D	′	″	S	D	′	″
Yeare proposed, 1649.	10	25	46	16	7	24	49	45
Aprill	0	17	10	2	3	5	50	55
day 10	4	1	54	27	4	10	38	59
The middle Longit. of ☾ frō ☉	3	14	50	45	3	11	19	39
Æquation substract		7	28	48				
	3	7	21	57				
The middle Longit. of ☉ add.		28	55	17	D	′	″	
The ☾ true place.	4	6	17	14	in 6	17	14	♌

An

Another Example for finding the true place of the Moon the 16 *of* June 1649, *at* 2 *houres,* 30 *minutes* P. M.

	Longi. of the ☾ frō the ☉				Anomalie of the ☾.			
	S	D	′	″	S	D	′	″
Yeare proposed, 1649.	10	25	46	16	7	24	49	45
June	1	10	48	11	5	22	48	45
day 16	6	15	3	7	6	29	2	23
houre 2		1	0	57		1	5	19
min. 30			15	14			16	20
The middle Longit. of ☾ frō ☉	6	22	53	45	8	18	2	32
Æquation adde		5	26	33				
	6	28	20	18				
The middle Longit. of ☉ adde	3	5	3	45		D	′	″
The ☾ true place.	10	3	24	3	in	3	24	3 ♒

Chap. VIII.

To Calculate the true Latitude of the Moone.

FIrſt finde the meane or equall motion of the Moones *Latitude*, to which adde, or ſubſtract the Moones *Æquation* (according as it ſhall be to be added, or ſubſtracted) and you ſhall have the true, *Coæquate*, or *corrected motion* of the Moones *Latitude*, with which enter the Table of the Moones *Latitude*, whoſe Title is, *A Table of the Moones Latitude*, and you ſhall there finde the true *Latitude* of the Moone, in the New and Full Moones. But at other times, that you may get the true Latitude of the Moone, you muſt againe enter the Table entituled, *A Table of the exceſſe, or diverſitie of the Moones Latitude*, *viz.* with the meane diſtance of the Moone from the Sunne, in the Head or Foote of the Table, and with the *Coæquate Anomalie* of the Moones Latitude, either on the right hand or on the left, (according as you ſhall finde it) and in the angle of meeting you ſhall have the *Exceſſe* or *Diverſitie* of the Moones *Latitude*, which is alwaies to be added to the *Latitude* before found, that it may be exact and abſolute.

An

An Example for finding the true latitude of the Moone, the 10 *of* April, 1649 *at noone.*

	S	D	′	″	
Year proposed, 1649	3	02	53	59	
Aprill	3	20	38	30	
Day 10	4	12	17	37	
The middle motion of the Moons Latitude	11	05	50	2	
Equation substract		07	28	48	
The true motion of the Moons Latitude	10	28	21	14	
The Moones Latitude		04	15	17	
The diversity of the Latitude, adde			12	43	
The Moones true Latitude *Sept.*		4	28	0	*Asc.*

CHAP. IX.

To finde the place of the Moones Node Ascending, *commonly called the* Dragons head.

ADde to the true Motion of the Moones *latitude*, three *Signes*, and the summe thereof take out of the true motion of the Moone, the Remainder shall bee the true motion of the *Dragons Head.*

An Example to finde the place of the Dragons Head *the said* 10 *of* April 1649 *at noone.*

	S	D	′	″
The true motion of the Moons Latitude	10	28	21	14
The quarter of a Circle, or 3 Signes	3	0	0	0
The true motion of the Moons latitude from the *Node* Asc.	1	28	21	14
The Moones true motion.	4	6	17	14
The true place of the Dragons head.	2	7	56	0

☊ in 7 De. 56′ 0″ ♓

CHAP.

Chap. X.

Of the Reduction of the Moone to the Ecliptique.

HAving ſhewed how to Compute the motion of the Moone in her proper Orbe, we will here ſhew you likewiſe, how you reduce the ſame to the *Ecliptique*, as thus. Enter the Table, whoſe title is, *A Table of the reduction of the Moone from her proper Orbe to the Ecliptique*, with the true motion of the Moones *latitude*, and you ſhall have the *Proſthaphæreticall* minutes, which adde to, or ſubſtract from, the true place of the Moone, according to the Titles, giveth the true place of the Moone in the Ecliptique.

Example. The true motion of the Moones latitude the ſaid 10 of *April*, 1649 is *Signe* 10 *D.* 28 *min.* 21. *ſe.* 14, with which I enter the Table of the *Reduction* of the Moon to the Ecliptique, and I find the *Proſthaphæreticall* minutes are 6 min. 16 ſeconds to be ſubſtracted, therefore I ſubſtract them from the true place of the Moone, which is *Signe* 4 *Deg.* 6 *min.* 17 *ſeconds* 14, and there remaineth the true place of the Moon in the Ecliptique, *Signe* 4 *Deg.* 6 *min.* 10. *ſeconds* 58.

Tables of the middle motion and Æquation of the Moon.

A TABLE of the middle motion of the Moon in Yeares.

Yeares of the Christian Æra	The Longitude of the ☾ from the ☉				The Anomalie of the ☾				The Latitude of the ☾			
	S	D	′	″	S	D	′	″	S	D	′	″
♋1640	6	22	35	36	3	27	9	18	5	4	47	51
1641	1	14	1	47	7	8	56	24	10	16	44	22
1642	3	24	1	47	10	7	39	35	3	15	27	7
1643	8	3	39	9	1	6	22	47	8	14	9	53
♋1644	0	13	16	31	4	5	5	59	1	12	52	38
1645	5	5	5	20	7	16	53	4	6	24	49	9
1646	9	14	42	42	10	15	36	16	11	23	31	54
1647	1	24	20	5	1	14	19	20	4	22	14	40
♋1648	6	3	57	27	4	13	2	40	9	20	57	25
1649	10	25	46	16	7	24	49	45	3	2	53	55
1650	3	5	23	38	10	23	32	57	8	1	36	41
1651	7	15	1	0	1	22	16	9	1	0	19	27
♋1652	11	24	38	22	4	20	59	22	5	29	2	12
1653	4	16	27	11	8	2	46	27	7	10	58	43
1654	8	26	4	33	11	1	29	38	4	9	41	28
1655	1	5	41	56	2	0	12	50	9	8	24	14
♋1656	5	15	19	18	4	28	56	2	2	7	6	59
1657	10	7	8	7	8	10	43	7	7	19	3	30
1658	2	16	45	29	11	9	26	19	0	17	46	15
1659	6	26	22	51	2	8	9	31	5	16	29	1
♋1660	11	6	0	13	5	6	52	43	10	15	11	46
1661	3	27	49	2	8	18	39	48	3	27	8	17
1662	8	7	26	24	11	17	23	0	8	25	51	3
1663	0	17	3	46	2	16	6	12	1	24	33	48
♋1664	4	26	41	9	5	14	49	24	6	23	16	33
1665	9	18	29	57	8	26	36	29	0	5	13	4
1666	1	28	7	20	11	25	19	41	5	3	55	50
1667	6	7	44	42	2	24	2	53	10	2	38	35
♋1668	10	17	22	4	5	22	46	5	3	1	21	20
1669	3	9	10	53	9	4	33	10	8	13	17	51
1670	7	18	48	15	0	3	16	22	1	12	0	37
1671	11	28	25	37	3	1	59	34	6	10	43	22
♋1672	4	8	3	0	6	0	42	46	11	9	26	8
1673	8	29	51	48	9	12	29	51	4	21	22	39
1674	1	9	29	11	0	11	13	3	9	20	5	24
1675	5	19	6	33	3	9	56	15	2	18	48	9

A Table of the middle motion of the Sun in years.

Yeares of the Christian Æra.	The Longitud. of the ☾ from the ☉.				The Anomalie of the ☾.				The Latitude of the ☾.			
	S	D	′	″	S	D	′	″	S	D	′	″
♋1676	9	28	43	55	6	8	39	27	7	17	30	55
1677	2	20	32	44	9	20	26	32	0	29	27	26
1678	7	0	10	6	0	19	9	44	5	28	10	11
1679	11	9	47	28	3	17	52	56	10	26	52	57
♋1680	3	19	24	50	6	16	36	8	3	25	35	42
1681	8	11	13	39	9	28	23	13	9	7	32	13
1682	0	20	51	1	0	27	6	25	2	6	14	58
1683	5	0	28	24	3	25	49	37	7	4	57	44
♋1684	9	10	5	46	6	24	32	49	0	3	40	29
1685	2	1	54	35	10	6	19	54	5	15	37	0
1686	6	11	31	57	1	5	3	6	10	14	19	45
1687	10	21	9	19	4	3	46	18	3	13	2	31
♋1688	3	0	45	41	7	2	29	30	8	11	45	16
1689	7	22	35	30	10	14	16	35	1	23	41	47
1690	0	2	12	52	1	12	59	47	3	22	24	33
1691	4	11	50	15	4	11	42	59	11	21	7	18
♋1692	8	21	27	37	7	10	26	11	4	19	50	3
1693	1	13	16	26	10	22	13	17	10	1	46	34
1694	5	22	53	48	1	20	56	28	3	0	29	20
1695	10	2	31	10	4	19	39	40	7	29	12	5
♋1696	2	12	8	32	7	18	22	52	0	27	54	50
1697	7	3	57	21	11	0	9	58	6	9	51	21
1698	11	13	54	43	1	28	53	9	11	8	34	7
1699	3	23	12	5	4	27	36	21	4	7	16	52
♋1700	8	2	49	28	7	26	19	33	9	5	59	28

These middle motions may be continued for many years, by adding to the Radix the yearly motions, as followeth.

To the { Longitude of the Sun 11ˢ 29ᵈ 45′ 42″ 30‴.
Apogæum of the Sun 00ˢ 00ᵈ 01′ 01″ 30‴.

To the { Distance of the ☾ from the ☉ 04ˢ 09ᵈ 37′ 22″
Anomalie of the ☾ 02ˢ 28ᵈ 43′ 11″ 30‴
Latitude of the ☾ 04ˢ 28ᵈ 42′ 45″

To the Leap-year adde their motion in one day more thereunto,

A Table of the middle motion of the Moon, in Moneths of the common Year.

Moneths of the Common Yeare.	Longitude of the ☾ from the ☉ S	D	′	″	The Anomalie of the ☾ S	D	′	″	The Latitude of the ☾ S	D	′	″
January.	0	0	0	0	0	0	0	0	0	0	0	0
Febzuary.	0	17	54	47	1	15	0	52	1	20	6	35
March.	11	29	15	14	1	30	50	4	2	9	31	53
Aprill.	0	17	10	2	3	5	50	55	3	20	38	30
May.	0	22	53	23	4	7	47	53	4	29	31	20
June.	1	10	48	11	5	22	48	45	6	17	37	55
July.	1	16	31	32	6	24	45	43	7	24	30	45
August.	2	4	26	20	8	9	46	35	9	14	37	20
September.	2	22	21	7	9	24	47	27	11	4	43	56
October.	2	28	4	28	10	26	44	26	0	11	36	46
November.	3	15	59	15	0	11	45	18	2	1	43	21
December.	3	21	42	35	1	13	42	16	3	8	36	11

A Table of the middle motion of the Moon in Moneths of the Bissextile Year.

Moneths of the Bissextile Year.	Longitude of the ☾ from the ☉ S	D	′	″	The Anomalie of the ☾ S	D	′	″	The Latitude of the ☾ S	D	′	″
January.	0	0	0	0	0	0	0	0	0	0	0	0
Febzuary.	0	17	54	47	1	15	0	52	1	20	6	35
March.	0	11	26	41	2	3	53	58	2	13	45	39
Aprill.	0	29	21	29	3	18	54	49	4	3	52	16
May.	1	5	4	50	4	20	51	47	5	10	45	6
June.	1	22	59	37	6	5	52	39	7	0	51	41
July.	1	28	42	59	7	7	49	37	8	7	44	31
August.	2	16	37	47	8	22	50	29	9	27	51	6
September.	3	4	82	33	10	7	51	22	11	17	57	41
October.	3	10	15	53	11	9	48	20	0	24	50	31
November.	3	28	10	41	0	24	49	12	2	14	57	7
December.	4	3	54	2	1	26	46	10	3	21	49	57

A Table of the middle motion of the Moon, in Dayes.

Dayes.	Longitude of the ☾ from the ☉				The Anomalie of the ☾				The Latitude of the ☾			
	S	D	′	″	S	D	′	″	S	D	′	″
1	0	12	11	27	0	13	3	54	0	13	13	46
2	0	24	22	55	0	26	7	48	0	26	27	31
3	1	6	34	20	1	9	11	42	1	9	41	17
4	1	18	45	47	1	22	15	36	1	22	55	3
5	2	0	57	13	2	5	19	30	2	6	8	48
6	2	13	8	40	2	18	23	24	2	19	22	34
7	2	25	20	7	3	1	27	18	3	2	36	20
8	3	7	31	34	3	14	31	12	3	15	50	5
9	3	19	43	0	3	27	35	6	3	29	3	51
10	4	1	54	27	4	10	38	59	4	12	17	37
11	4	14	5	54	4	23	42	53	4	25	31	22
12	4	26	17	20	5	6	46	47	5	8	45	8
13	5	8	28	47	5	19	50	41	5	21	58	54
14	5	20	40	14	6	2	54	35	6	5	12	39
15	6	2	51	40	6	15	58	29	6	18	26	25
16	6	15	3	7	6	29	2	23	7	1	40	11
17	6	27	14	34	7	12	6	17	7	14	53	56
18	7	9	26	0	7	25	10	11	7	28	7	42
19	7	21	37	27	8	8	14	5	8	11	21	28
20	8	3	48	54	8	21	17	59	8	24	35	13
21	8	16	0	21	9	4	21	53	9	7	48	59
22	8	28	11	47	9	17	25	47	9	21	2	44
23	9	10	23	14	10	0	29	41	10	4	16	30
24	9	22	34	41	10	13	33	35	10	17	30	16
25	10	4	46	7	10	26	37	29	11	0	44	1
26	10	16	57	34	11	9	41	23	11	13	57	47
27	10	29	9	1	11	22	45	17	11	27	11	33
28	11	11	20	28	0	5	49	11	0	10	25	18
29	11	23	32	54	0	18	53	5	0	23	39	4
30	0	5	43	21	1	1	56	57	1	6	52	50
31	0	17	54	47	1	15	0	51	1	20	6	35

A Table of the middle motion of the Moon in Houres and Minutes.

Houres.	The Longitude of ☾ from ☉			The Anomalie of the ☾			The Latitude of the ☾		
	D	′	″	D	′	″	D	′	″
0	0	0	0	0	0	0	0	0	0
1	0	30	29	0	32	40	0	33	4
2	1	0	57	1	5	19	1	6	9
3	1	31	26	1	37	59	1	39	13
4	2	1	54	2	10	39	2	12	18
5	2	32	23	2	43	19	2	45	22
6	3	2	52	3	15	58	3	18	26
7	3	33	20	3	48	48	3	51	31
8	4	3	49	4	21	18	4	24	35
9	4	34	17	4	53	58	4	57	40
10	5	4	46	5	26	37	5	30	44
11	5	35	15	5	59	17	6	3	48
12	6	5	43	6	31	57	6	36	53
13	6	36	12	7	4	37	7	9	57
14	7	6	41	7	37	16	7	43	2
15	7	37	9	8	9	56	8	16	6
16	8	7	38	8	42	36	8	49	10
17	8	38	6	9	15	16	9	22	15
18	9	8	35	9	47	55	9	55	19
19	9	39	4	10	20	35	10	28	24
20	10	9	32	10	53	15	11	1	28
21	10	40	1	11	25	55	11	34	32
22	11	10	29	11	58	34	12	7	37
23	11	40	58	12	31	14	12	40	31
24	12	11	27	13	3	54	13	13	46
25	12	41	55	13	36	34	13	46	50
26	13	12	24	14	9	13	14	19	54
27	13	42	53	14	41	53	14	52	59
28	14	13	21	15	14	33	15	26	3
29	14	43	50	15	47	13	15	59	8
30	15	14	18	16	19	52	16	32	12
Minutes	′	″	‴	′	″	‴	′	″	‴

A Table of the middle motion of the Moon, in Houres and Minutes

Houres.	The Longitude of ☾ from ☉ D	′	″	The Anomalie of the ☾ D	′	″	The Latitude of the ☾ D	′	″
31	15	44	47	16	52	32	17	5	17
32	16	15	16	17	25	12	17	38	21
33	16	45	45	17	57	52	18	11	25
34	17	16	13	18	30	31	18	44	30
35	17	46	41	19	3	11	19	17	34
36	18	17	10	19	35	51	19	50	38
37	18	47	39	20	8	31	20	23	43
38	19	18	7	20	41	10	20	56	47
39	19	48	36	21	13	50	21	29	51
40	20	19	4	21	46	30	22	2	56
41	20	49	33	22	19	10	22	36	0
42	21	20	2	22	51	49	23	9	4
43	21	50	30	23	24	29	23	42	9
44	22	20	59	23	57	9	24	15	13
45	22	51	28	24	29	9	24	48	18
46	23	21	57	25	2	28	25	21	22
47	23	52	25	25	35	8	25	54	26
48	24	22	53	26	7	48	26	27	31
49	24	53	22	26	40	28	27	0	35
50	25	23	51	27	13	7	27	33	40
51	25	54	19	27	45	47	28	6	44
52	26	24	48	28	18	27	28	39	48
53	26	55	16	28	51	7	29	12	53
54	27	25	45	29	23	46	29	45	57
55	27	56	14	29	56	26	30	19	1
56	28	26	42	30	29	6	30	52	6
57	28	57	11	31	1	45	31	25	10
58	29	27	39	31	34	25	31	58	15
59	29	58	7	32	7	5	32	31	19
60	30	28	37	32	39	45	33	4	24
Minutes	′	″	‴	′	″	‴	′	″	‴

A Table of the Æquation of the Moon resolv'd

The mean distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	s 0	d 00	s 0	d 60	s 0	d 120	s 0	d 180	s 0	d 240	s 1	d 0	The Anomalie of the ☾
	substr. D	′	substr. D	′	subst. D	′	subst. D	′	subst. D	′	subst. D	′	
Signe 0	0	00	0	8	0	16	0	25	0	34	0	45	Signe 12
3	0	14	0	22	0	30	0	39	0	50	1	1	27
6	0	28	0	36	0	45	0	54	1	5	1	18	24
9	0	43	0	51	0	59	1	10	1	21	1	33	21
12	0	57	1	5	1	14	1	24	1	36	1	49	18
15	1	11	1	19	1	28	1	38	1	51	2	5	15
18	1	24	1	33	1	42	1	53	2	5	2	20	12
21	1	38	1	46	1	56	2	7	2	20	2	35	9
24	1	51	1	59	2	09	2	20	2	34	2	49	6
27	2	5	2	12	2	22	2	34	2	47	3	3	3
Signe 1	2	17	2	25	2	35	2	47	3	1	3	17	Signe 11
3	2	30	2	37	2	48	3	0	3	14	3	31	27
6	2	42	2	49	3	00	3	12	3	27	3	44	24
9	2	54	3	2	3	12	3	24	3	39	3	56	21
12	3	6	3	13	3	23	3	36	3	50	4	8	18
15	3	17	3	24	3	34	3	47	4	2	4	19	15
18	3	28	3	34	3	45	3	57	4	13	4	30	12
21	3	38	3	44	3	54	4	7	4	23	4	40	9
24	3	47	3	54	4	4	4	16	4	32	4	50	6
27	3	57	4	3	4	13	4	25	4	41	4	59	3
Signe 2	4	5	4	11	4	23	4	33	4	49	5	7	Signe 10
3	4	13	4	19	4	28	4	40	4	57	5	14	27
6	4	20	4	26	4	34	4	48	5	3	5	21	24
9	4	27	4	33	4	40	4	54	5	9	5	27	21
12	4	33	4	39	4	46	4	59	5	14	5	32	18
15	4	39	4	44	4	51	5	4	5	19	5	36	15
18	4	43	4	48	4	55	5	8	5	23	5	40	12
21	4	47	4	52	4	59	5	11	5	25	5	42	9
24	4	51	4	54	5	1	5	13	5	27	5	44	6
27	4	53	4	56	5	3	5	14	5	28	5	45	3
Signe 3	4	55	4	58	5	4	5	15	5	29	5	44	Signe 9
	6	0	5	24	5	18	5	12	5	6	5	0	
The Anomalie of the ☾	s	d	s	d	s	d	s	d	s	d	s	d	The Anomalie of the ☾
	Adde		Adde.		Adde.		Adde		Adde.		Adde.		

The mean distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	The meane distance of the ☾ from the ☉, or from his ☌.												The Anomalie of the ☾
	s d	s d	s d	s d	s d	s d							
	0 0	2 6	0 12	0 18	0 24	1 0							
	subst.	substr.	subst.	subst.	subst.	substr.							
	D ′	D ′	D ′	D ′	D ′	D ′							
Signe 3	4 55	4 58	5 4	5 15	5 29	5 44							Signe 9
3	4 56	4 59	5 4	5 14	5 28	5 43							27
6	4 56	4 58	5 3	5 13	5 26	5 41							24
9	4 55	4 57	5 2	5 11	5 24	5 38							21
12	4 54	4 55	4 59	5 08	5 20	5 34							18
15	4 51	4 52	4 56	5 04	5 15	5 28							15
18	4 48	4 49	4 52	5 00	5 10	5 22							12
21	4 44	4 44	4 47	4 54	5 5	5 17							9
24	4 39	4 39	4 41	4 47	4 57	5 8							6
27	4 34	4 33	4 34	4 40	4 48	4 59							3
Signe 4	4 27	4 25	4 27	4 31	4 38	4 48							Signe 8
3	4 20	4 17	4 18	4 22	4 29	4 37							27
6	4 11	4 8	4 9	4 12	4 18	4 25							24
9	4 3	3 59	3 59	4 2	4 7	4 13							21
12	3 53	3 49	3 49	3 50	3 54	3 59							18
15	3 42	3 38	3 37	3 38	3 41	3 44							15
18	3 31	3 26	3 24	3 25	3 27	3 29							12
21	3 19	3 14	3 11	3 11	3 12	3 13							9
24	3 7	3 1	2 57	2 57	2 56	2 56							6
27	2 53	2 48	2 43	2 41	2 40	2 36							3
Signe 5	2 40	2 34	2 28	2 26	2 23	2 19							Signe 7
3	2 25	2 18	2 13	2 10	2 5	2 2							27
6	2 10	2 3	1 57	1 53	1 48	1 43							24
9	1 55	1 48	1 41	1 36	1 30	1 24							21
12	1 39	1 32	1 24	1 18	1 12	1 4							18
15	1 23	1 15	1 7	1 1	0 53	0 45							15
18	1 7	0 59	0 50	0 43	0 34	0 25							12
21	0 51	0 42	0 33	0 25	0 15	0 4							9
24	0 34	0 25	0 16	0 7	0 0	0 16							6
27	0 17	0 8	0 1	0 12	0 23	0 36							3
Signe 6	0 0	0 10	0 19	0 30	0 42	0 56							Signe 6
	6 0	5 24	5 18	5 12	5 6	5 0							
	s d	s d	s d	s d	s d	s d							
The Anomalie of the ☾	substr.	substr.	subst	subst.	substr	subst.							The Anomalie of the ☾
	The mean distance of the ☾ from the ☉, or from his ☌.												

The Anomalie of the ☾	The meane distance of the ☾ from the ☉, or from his ☌.												The Anomalie of the ☾
	s	d	s	d	s	d	s	d	s	d	s	d	
	0	0	0	6	0	12	0	18	0	24	1	0	
	Adde.		Adde		Adde.		Adde.		Adde.		Adde.		
	D	′	D	′	D	′	D	′	D	′	D	′	
Signe 6	0	0	0	10	0	19	0	30	0	42	0	56	Signe 6
3	0	17	0	27	0	36	0	47	1	1	1	15	27
6	0	34	0	43	0	54	1	5	1	19	1	35	24
9	0	51	1	0	1	11	1	23	1	37	1	54	21
12	1	7	1	17	1	28	1	40	1	56	2	13	18
15	1	23	1	33	1	44	1	57	2	13	2	31	15
18	1	39	1	49	2	0	2	13	2	30	2	48	12
21	1	55	2	5	2	16	2	29	2	46	3	05	09
24	2	10	2	20	2	31	2	45	3	3	3	22	06
27	2	25	2	35	2	46	3	0	3	19	3	37	03
Signe 7	2	40	2	49	3	1	3	15	3	33	3	52	Signe 5
3	2	53	3	3	3	14	3	28	3	46	4	06	27
6	3	7	3	16	3	27	3	41	3	59	4	20	24
9	3	19	3	28	3	39	3	53	4	11	4	32	21
12	3	31	3	39	3	51	4	5	4	23	4	43	18
15	3	42	3	50	4	2	4	16	4	33	4	54	15
18	3	53	4	0	4	12	4	25	4	43	5	03	12
21	4	3	4	10	4	21	4	34	4	52	5	12	09
24	4	11	4	18	4	29	4	42	5	00	5	20	06
27	4	20	4	26	4	37	4	50	5	07	5	27	03
Signe 8	4	27	4	33	4	43	4	56	5	13	5	32	Signe 4
3	4	34	4	40	4	49	5	1	5	17	5	36	27
6	4	39	4	45	4	54	5	6	5	21	5	40	24
9	4	44	4	49	4	58	5	10	5	25	5	42	21
12	4	48	4	53	5	1	5	12	5	27	5	44	18
15	4	51	4	55	5	3	5	14	5	28	5	45	15
18	4	54	4	57	5	5	5	15	5	29	5	45	12
21	4	55	4	58	5	6	5	15	5	28	5	43	09
24	4	56	4	59	5	5	5	14	5	27	5	41	06
27	4	56	4	58	5	4	5	13	5	24	5	39	03
Signe 9	4	55	4	57	5	2	5	10	5	21	5	35	Signe 3
	6	0	5	24	5	18	5	12	5	6	5	00	
The Anomalie of the ☾	s	d	s	d	s	d	s	d	s	d	s	d	The Anomalie of the ☾
	subst.		substr.		subst		substr.		substr.		substr.		
	The meane distance of the ☾ from the ☉, or from his ☌.												

The mean distance of the ☾ from the ☉, or from his ☍.

The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	0 0	0 6	0 12	0 18	0 24	1 0	
	Adde	Adde.	Adde	Adde	Adde	Adde	
	D ′	D ′	D ′	D ′	D ′	D ′	
Signe 9	4 55	4 56	5 2	5 10	5 22	5 35	Signe 3
3	4 53	4 54	4 59	5 7	5 17	5 30	27
6	4 51	4 51	4 56	5 2	5 12	5 24	24
9	4 47	4 47	4 52	4 58	5 6	5 17	21
12	4 43	4 43	4 47	4 52	5 0	5 10	18
15	4 39	4 38	4 41	4 45	4 53	5 3	15
18	4 33	4 32	4 35	4 38	4 45	4 54	12
21	4 27	4 26	4 28	4 30	4 37	4 45	9
24	4 20	4 19	4 20	4 22	4 27	4 35	6
27	4 13	4 11	4 11	4 13	4 18	4 24	3
Signe 10	4 5	4 2	4 2	4 3	4 7	4 13	Signe 2
3	3 57	3 53	3 53	3 54	3 57	4 1	27
6	3 47	3 44	3 43	3 43	3 46	3 49	24
9	3 38	3 34	3 32	3 32	3 34	3 36	21
12	3 28	3 23	3 21	3 21	3 22	3 23	18
15	3 17	3 12	3 10	3 8	3 8	3 9	15
18	3 6	3 2	2 58	2 56	2 55	2 55	12
21	2 54	2 49	2 46	2 43	2 41	2 41	9
24	2 42	2 37	2 33	2 30	2 27	2 26	6
27	2 30	2 24	2 20	2 16	2 13	2 11	3
Signe 11	2 17	2 12	2 7	2 3	1 59	1 56	Signe 1
3	2 5	1 58	1 53	1 49	1 44	1 40	27
6	1 51	1 45	1 39	1 34	1 29	1 24	24
9	1 38	1 31	1 25	1 20	1 14	1 8	21
12	1 24	1 18	1 11	1 5	0 59	0 52	18
15	1 11	1 3	0 57	0 50	0 43	0 36	15
18	0 57	0 49	0 42	0 35	0 27	0 20	12
21	0 43	0 35	0 28	0 20	0 12	0 3	9
24	0 28	0 21	0 13	0 5	0 3	0 13	6
27	0 14	0 6	0 1	0 9	0 19	0 29	3
Signe 12	0 0	0 8	0 16	0 24	0 34	0 45	Signe 0
	6 0	5 24	5 18	5 12	5 6	5 0	
The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	Adde.	Adde.	Adde.	Adde	Adde	Adde	

The mean distance of the ☾ from the ☉, or from his ☍.

The mean distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	1 0	1 6	1 12	1 18	1 24	2 0	
	substr.	substr.	substr.	substr.	substr.	substr.	
	D ′	D ′	D ′	D ′	D ′	D ′	
♈	0 0	45 0	56 1	8 1	17 1	23 1	25 ♈ 12
3	1 1	1 13	1 25	1 35	1 42	1 44	27
6	1 18	1 30	1 42	1 53	2 1	2 3	24
9	1 33	1 46	1 59	2 10	2 19	2 21	21
12	1 49	2 3	2 16	2 28	2 37	2 40	18
15	2 5	2 18	2 32	2 45	2 55	2 58	15
18	2 20	2 34	2 48	3 2	3 12	3 17	12
21	2 35	2 49	3 4	3 17	3 28	3 33	9
24	2 49	3 4	3 20	3 34	3 45	3 51	6
27	3 3	3 19	3 35	3 49	4 1	4 7	3
♉	3 17	3 34	3 50	4 5	4 17	4 24	♉ 11
3	3 31	3 47	4 4	4 19	4 32	4 39	27
6	3 44	4 0	[illegible]	4 33	4 46	4 53	24
9	3 56	4 13	4 30	[illegible]	[illegible]	5 9	21
12	4 8	4 25	4 43	[illegible]	[illegible]	[illegible] 22	18
15	4 19	4 37	4 55	[illegible]	[illegible]	[illegible] 35	15
18	4 30	4 49	5 6	5 23	5 38	5 48	12
21	4 40	4 59	5 16	5 33	5 49	5 59	9
24	4 50	5 9	5 26	5 43	5 59	6 9	6
27	4 59	5 18	5 35	5 52	6 6	6 19	3
♊	5 7	5 26	5 43	6 1	6 17	6 28	♊ 10
3	5 14	5 33	5 51	6 8	6 24	6 36	27
6	5 21	5 40	5 57	6 15	6 31	6 43	24
9	5 27	5 46	6 3	6 21	6 38	6 50	21
12	5 32	5 50	6 8	6 25	6 42	6 54	18
15	5 36	5 54	6 12	6 29	6 45	6 58	15
18	5 40	5 57	6 15	6 32	6 48	7 2	12
21	5 42	6 0	6 17	6 34	6 50	7 4	9
24	5 44	6 1	6 18	6 34	6 51	7 4	6
27	5 45	6 1	6 17	6 34	6 50	7 4	3
♋	5 44	6 1	6 16	6 32	6 48	7 2	♋ 9
	5 0	4 24	4 18	4 12	4 6	4 0	
The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	Adde	Adde	Adde	Adde	Adde	Adde	

The mean distance of the ☾ from the ☉, or from his ☌.

The mean distance of the Moon from the ☉, or from his ☌.

The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	1 0	1 6	1 12	1 18	1 24	2 0	
	substr. D ′	substr. D ′	substr. D ′	substr. D ′	substr. D ′	substr. D ′	
Signe 3	5 44	6 1	6 16	6 32	6 48	7 2	Signe 9
3	5 43	5 59	6 14	6 29	6 45	6 59	27
6	5 41	5 56	6 10	6 25	6 40	6 55	24
9	5 38	5 52	6 6	6 21	6 35	6 50	21
12	5 34	5 47	6 0	6 15	6 29	6 43	18
15	5 28	5 42	5 54	6 7	6 21	6 35	15
18	5 22	5 35	5 47	5 58	6 12	6 26	12
21	5 17	5 27	5 38	5 49	6 2	6 16	9
24	5 8	5 17	5 27	5 38	5 51	6 4	6
27	4 59	5 7	5 16	5 26	5 39	5 51	3
Signe 4	4 48	4 56	5 5	5 14	5 25	5 37	Signe 8
3	4 37	4 44	4 52	4 59	5 10	5 22	27
6	4 25	4 31	4 38	4 45	4 54	5 6	24
9	4 13	4 17	4 22	4 29	4 37	4 49	21
12	3 59	4 3	4 6	4 12	4 19	4 30	18
15	3 44	3 47	3 50	3 54	4 0	4 11	15
18	3 29	3 31	3 32	3 35	3 40	3 50	12
21	3 13	3 13	3 14	3 15	3 20	3 29	9
24	2 56	2 55	2 54	2 55	2 59	3 7	6
27	2 36	2 36	2 35	2 34	2 36	2 44	3
Signe 5	2 19	2 17	2 14	2 12	2 13	2 20	Signe 7
3	2 2	1 58	1 53	1 50	1 50	1 56	27
6	1 43	1 38	1 32	1 27	1 27	1 32	24
9	1 24	1 18	1 10	1 5	1 3	1 8	21
12	1 4	0 56	0 48	0 42	0 39	0 43	18
15	0 45	0 35	0 26	0 18	0 14	0 17	15
18	0 25	0 14	0 4	0 5	0 10	0 9	12
21	0 4	0 7	0 18	0 29	0 35	0 35	9
24	0 16	0 28	0 48	0 52	0 59	1 0	6
27	0 36	0 50	1 3	1 15	1 23	1 24	3
Signe 6	0 56	1 10	1 25	1 38	1 47	1 49	Signe 6
	5 0	4 24	4 18	4 12	4 6	4 0	
	s d	s d	s d	s d	s d	s d	
The Anomalie of the ☾	substr.	substr.	substr.	substr.	substr.	substr.	The Anomalie of the ☾

The mean distance of the ☾ from ths ☉, or from his ☌.

The Anomalie of the ☾	The meane distance of the ☾ from the ☉, or from his ☌.												The Anomalie of the ☾
	s	d	s	d	s	d	s	d	s	d	s	d	
	1	0	1	6	1	12	1	18	1	24	2	6	
	Adde		Adde.		Adde		Adde		Adde		Adde.		
	D	′	D	′	D	′	D	′	D	′	p	′	
Signe 6	0	56	1	10	1	25	1	38	1	47	1	49	Signe 6
3	1	15	1	31	1	46	2	0	2	10	2	13	27
6	1	35	1	51	2	7	2	22	2	33	2	37	24
9	1	54	2	11	2	27	2	43	2	55	2	59	21
12	2	13	2	30	2	47	3	4	3	16	3	21	18
15	2	31	2	49	3	7	3	24	3	37	3	43	15
18	2	48	3	7	3	26	3	43	3	57	4	4	12
21	3	5	3	25	3	44	4	1	4	16	4	23	9
24	3	22	3	42	4	1	4	19	4	34	4	43	6
27	3	37	3	57	4	17	4	36	4	51	5	0	3
Signe 7	3	52	4	12	4	32	4	52	5	8	5	17	Signe 5
3	4	6	4	26	4	46	5	6	5	22	5	33	27
6	4	20	4	40	5	0	5	20	5	36	5	47	24
9	4	32	4	52	5	12	5	32	5	48	6	0	21
12	4	43	5	4	5	24	5	43	6	0	6	12	18
15	4	54	5	14	5	34	5	53	6	10	6	22	15
18	5	3	5	23	5	43	6	2	6	19	6	32	12
21	5	12	5	32	5	51	6	10	6	27	6	40	9
24	5	20	5	40	5	58	6	17	6	35	6	47	6
27	5	27	5	46	6	4	6	22	6	40	6	53	3
Signe 8	5	32	5	51	6	9	6	27	6	44	6	57	Signe 4
3	5	36	5	55	6	13	6	30	6	47	7	0	27
6	5	40	5	58	6	16	6	33	6	50	7	3	24
9	5	42	6	0	6	17	6	34	6	51	7	4	21
12	5	44	6	1	6	18	6	34	6	51	7	4	18
15	5	45	6	1	6	17	6	33	6	49	7	2	15
18	5	45	6	1	6	16	6	31	6	46	6	59	12
21	5	43	5	59	6	13	6	29	6	43	6	56	9
24	5	41	5	56	6	10	6	25	6	39	6	52	6
27	5	39	5	52	6	5	6	20	6	33	6	46	3
Signe 9	5	35	5	47	6	0	6	13	6	26	6	39	Signe 3
	5	0	4	24	4	18	4	12	4	6	4	0	
The Anomalie of the ☾	s	d	s	d	s	d	s	d	s	d	s	d	The Anomalie of the ☾
	substr.		substr.		substr.		substr.		substr.		substr.		
	The meane distance of the ☾ from the ☉, or from his ☌.												

The mean distance of the Moon from the ☉, or from his ☌.

The Anomalie of the ☾	s d 1 0	s d 1 6	s d 1 12	s d 1 18	s d 1 24	s d 2 9	The Anomalie of the ☾
	Adde D ′	Adde D ′	Adde D ′	Adde D ′	Adde D ′	substr. D ′	
Signe 9	5 35	5 47	6 0	6 13	6 26	5 39	Signe 3
3	5 30	5 42	5 53	6 5	6 18	6 31	27
6	5 24	5 35	5 46	5 57	6 10	6 23	24
9	5 17	5 28	5 38	5 48	6 1	6 13	21
12	5 10	5 20	5 29	5 39	5 51	6 3	18
15	5 3	5 11	5 20	5 29	5 40	5 51	15
18	4 54	5 1	5 10	5 18	5 28	5 38	12
21	4 45	4 51	4 59	5 6	5 16	5 27	9
24	4 35	4 40	4 48	4 54	5 3	5 14	6
27	4 24	4 29	4 35	4 41	4 49	5 0	3
Signe 10	4 13	4 17	4 22	4 28	4 35	4 45	Signe 2
3	4 1	4 5	4 9	4 13	4 19	4 29	27
6	3 49	3 52	3 55	3 59	4 4	4 13	24
9	3 36	3 38	3 40	3 43	3 48	3 56	21
12	3 23	3 24	3 25	3 27	3 31	3 39	18
15	3 9	3 9	3 10	3 11	3 14	3 22	15
18	2 55	2 54	2 54	2 54	2 57	3 5	12
21	2 41	2 39	2 38	2 37	2 40	2 47	9
24	2 26	2 23	2 21	2 20	2 22	2 28	6
27	2 11	2 8	2 5	2 3	2 4	2 9	3
Signe 11	1 56	1 52	1 48	1 45	1 46	1 50	Signe 1
3	1 40	1 36	1 30	1 27	1 27	1 31	27
6	1 24	1 19	1 13	1 9	1 8	1 11	24
9	1 8	1 2	0 56	0 51	0 49	0 52	21
12	0 52	0 45	0 38	0 33	0 31	0 33	18
15	0 36	0 28	0 20	0 14	0 11	0 14	15
18	0 20	0 12	0 3	0 4	0 8	0 6	12
21	0 3	0 6	0 15	0 22	0 27	0 26	9
24	0 13	0 22	0 32	0 41	0 46	0 45	6
27	0 29	0 39	0 50	0 59	1 4	1 5	3
Signe 12	0 45	0 56	1 8	1 17	1 23	1 24	Signe 0
	5 0	4 24	4 18	4 12	4 6	4 0	
	s d	s d	s d	s d	s d	s d	
The Anomalie of the ☾	Adde	Adde	Adde	Adde	Adde	Adde	The Anomalie of the ☾

The mean distance of the ☾ from the ☉, or from his ☌.

The mean distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	s 2	d s 0	2	d s 6	2	d s 12	2	d s 18	2	d s 24	3	d s 0	The Anomalie of the ☾
	substr.	′	substr.	′	substr.	′	substr.	′	substr.	′	substr.	′	
	D		D		D		D		D		D		
Signe 0	1	25	1	21	1	9	0	50	0	26	0	0	Signe 12
3	1	44	1	40	1	29	1	11	0	47	0	21	27
6	2	3	1	59	1	49	1	31	1	8	0	42	24
9	2	21	2	20	2	9	1	52	1	29	1	3	21
12	2	40	2	38	2	29	2	13	1	49	1	25	18
15	2	58	2	57	2	48	2	32	2	10	1	46	15
18	3	17	3	16	3	7	2	52	2	29	2	6	12
21	3	33	3	34	3	25	3	11	2	49	2	26	9
24	3	51	3	52	3	43	3	31	3	9	2	46	6
27	4	7	4	9	4	2	3	49	3	29	3	5	3
Signe 1	4	24	4	26	4	19	4	7	3	47	3	25	Signe 11
3	4	39	4	43	4	37	4	25	4	5	3	44	27
6	4	55	4	58	4	53	4	42	4	24	4	3	24
9	5	9	5	13	5	8	4	58	4	42	4	21	21
12	5	22	5	27	5	23	5	14	4	58	4	39	18
15	5	35	5	41	5	38	5	30	5	14	4	56	15
18	5	48	5	54	5	52	5	44	5	30	5	13	12
21	5	59	6	6	6	4	5	58	5	45	5	28	9
24	6	9	6	17	6	17	6	11	5	58	5	43	6
27	6	19	6	27	6	28	6	23	6	12	5	58	3
Signe 2	6	28	6	37	6	38	6	34	6	24	6	11	Signe 10
3	6	36	6	46	6	47	6	45	6	36	6	24	27
6	6	43	6	54	6	56	6	56	6	47	6	35	24
9	6	50	7	0	7	4	7	3	6	57	6	47	21
12	6	54	7	6	7	11	7	10	7	5	6	56	18
15	6	58	7	11	7	16	7	19	7	13	7	6	15
18	7	2	7	14	7	20	7	24	7	20	7	14	12
21	7	4	7	17	7	23	7	29	7	26	7	21	9
24	7	4	7	18	7	25	7	32	7	30	7	28	6
27	7	4	7	17	7	26	7	34	7	34	7	32	3
Signe 3	7	2	7	16	7	27	7	35	7	37	7	36	Signe 9
	4	0	3	24	3	18	3	12	3	6	3	0	
The Anomalie of the ☾	s	d	s	d	s	d	s	d	s	d	s	d	The Anomalie of the ☾
	Adde		Adde		Adde		Adde		Adde		Adde		

The mean distance of the Moon from the ☉, or from his ☌.

The meane distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	2 0	2 6	2 12	2 18	2 24	3 0	
	Subst. ☽ ′	Substr. ☽ ′	Substr. ☽ ′	Substr. ☽ ′	Substr. ☽ ′	Substr. ☽ ′	
Signe 3	7 2	7 16	7 27	7 34	7 37	7 36	Signe 9
3	6 59	7 13	7 24	7 33	7 37	7 38	27
6	6 55	7 9	7 21	7 31	7 37	7 40	24
9	6 50	7 5	7 17	7 28	7 35	7 40	21
12	6 43	6 59	7 11	7 24	7 32	7 39	18
15	6 35	6 51	7 5	7 18	7 28	7 36	15
18	6 26	6 42	6 57	7 10	7 23	7 32	12
21	6 16	6 32	6 47	7 3	7 16	7 27	9
24	6 4	6 20	6 36	6 53	7 7	7 20	6
27	5 51	6 7	6 24	6 41	6 58	7 13	3
Signe 4	5 37	5 54	6 10	6 29	6 48	7 3	Signe 8
3	5 22	5 38	5 55	6 15	6 35	6 53	27
6	5 6	5 22	5 39	6 1	6 21	6 40	24
9	4 49	5 5	5 22	5 46	6 6	6 28	21
12	4 30	4 45	5 4	5 28	5 50	6 13	18
15	4 11	4 26	4 44	5 9	5 33	5 56	15
18	3 50	4 5	4 24	4 50	5 14	5 39	12
21	3 29	3 44	4 3	4 29	4 54	5 21	9
24	3 7	3 21	3 40	4 7	4 33	5 2	6
27	2 44	2 58	3 17	3 44	4 11	4 40	3
Signe 5	2 20	2 33	2 53	3 20	3 48	4 19	Signe 7
3	1 56	2 9	2 28	2 55	3 24	3 56	27
6	1 32	1 44	2 3	2 30	2 59	3 22	24
9	1 8	1 19	1 38	2 4	2 34	3 7	21
12	0 43	0 52	1 11	1 38	2 9	2 42	18
15	0 17	0 26	0 44	1 11	1 42	2 16	15
18	0 ♑ 9	0 ♑ 0	0 18	0 44	1 16	1 49	12
21	0 35	0 26	0 ♑ 9	0 ♑ 16	0 48	1 23	9
24	1 0	0 52	0 35	0 ♑ 10	0 20	0 55	6
27	1 24	1 18	1 2	0 38	0 ♑ 7	0 28	3
Signe 6	1 49	1 43	1 29	1 5	0 35	0 0	Signe 6
	4 0	3 24	3 18	3 12	3 6	3 0	
The Anomalie of the ☾	s d	s d	s d	s d	s d	s d	The Anomalie of the ☾
	Substr.	Substr.	Substr.	Substr.	Substr.	Adde.	

The meane distance of the ☾ from the ☉, or from his ☌.

The mean distance of the ☾ from the ☉, or from his ☌.

The Anomalie of the ☾	s 2 d 0	s 2 d 6	s 2 d 12	s 2 d 18	s 2 d 24	s 3 d 0	The Anomalie of the ☾
	Adde D /	Adde D /	Adde D /	Adde D /	Adde D /	Adde D /	
Signe 6	1 49	1 43	1 29	1 5	0 35	0 0	Signe 6
3	2 13	2 8	1 54	1 32	1 2	0 28	27
6	2 37	2 33	2 20	1 59	1 29	0 55	24
9	2 59	2 57	2 45	2 25	1 56	1 28	21
12	3 21	3 21	3 10	2 50	2 22	1 49	18
15	3 43	3 43	3 33	3 14	2 47	2 16	15
18	4 4	4 5	3 56	3 38	3 12	2 42	12
21	4 23	4 26	4 17	4 1	3 36	3 7	9
24	4 43	4 46	4 38	4 23	4 0	3 32	6
27	5 0	5 5	4 57	4 44	4 22	3 56	3
Signe 7	5 18	5 23	5 19	5 4	4 44	4 19	Signe 5
3	5 32	5 38	5 34	5 23	5 4	4 40	27
6	5 47	5 53	5 50	5 41	5 23	5 2	24
9	6 0	6 7	6 5	5 57	5 41	5 21	21
12	6 12	6 20	6 19	6 13	5 58	5 39	18
15	6 22	6 31	6 31	6 26	6 13	5 56	15
18	6 32	6 42	6 43	6 39	6 28	6 13	12
21	6 40	6 50	6 53	6 50	6 41	6 28	9
24	6 47	6 58	7 2	7 1	6 53	6 40	6
27	6 53	7 4	7 9	7 10	7 3	6 53	3
Signe 8	6 57	7 10	7 15	7 18	7 12	7 3	Signe 4
3	7 0	7 14	7 19	7 24	7 19	7 13	27
6	7 3	7 17	7 23	7 28	7 25	7 22	24
9	7 4	7 18	7 25	7 32	7 30	7 27	21
12	7 4	7 18	7 26	7 34	7 34	7 32	18
15	7 2	7 17	7 26	7 34	7 36	7 36	15
18	6 59	7 14	7 24	7 34	7 37	7 39	12
21	6 56	7 11	7 21	7 32	7 37	7 40	9
24	6 52	7 7	7 17	7 29	7 35	7 40	6
27	6 46	7 1	7 13	7 24	7 32	7 39	3
Signe 9	6 39	6 54	7 7	7 20	7 28	7 36	Signe 3
	4 0	3 24	3 18	3 12	3 6	3 0	
The Anomalie of the ☾	s d subſtr.	s d subſtr.	s d subſtr.	s d subſtr.	s d subſtr.	s d subſtr.	The Anomalie of the ☾

The mean distance of the Moon from the ☉, or from his ☍.

The Anomalie of the ☾	The mean distance of the ☾ from the ☉, or from his ☌.										The Anomalie of the ☾
	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	
	2 0	2 6	2 12	2 18	2 24	3 0					
	Adde	Adde.	Add	Adde	Adde	Adde					
	D /	D /	D /	D /	D /	D /					
Signe 9	6 39	6 54	7 07	7 19	7 28	7 36					Signe 3
3	6 31	6 46	6 59	7 12	7 22	7 32					27
6	6 23	6 37	6 51	7 05	7 16	7 28					24
9	6 13	6 27	6 41	6 56	7 09	7 21					21
12	6 3	6 17	6 31	6 47	7 01	7 14					18
15	5 51	6 06	6 20	6 26	6 52	7 06					15
18	5 38	5 54	6 08	6 25	6 41	6 56					12
21	5 27	5 41	5 55	6 13	6 30	6 47					9
24	5 14	5 28	5 42	5 59	6 18	6 35					6
27	5 00	5 14	5 27	5 46	6 05	6 24					3
Signe 10	4 45	4 59	5 13	5 32	5 51	6 11					Signe 2
3	4 29	4 43	4 58	5 17	5 37	5 58					27
6	4 13	4 26	4 42	5 01	5 22	5 43					24
9	3 56	4 10	4 25	4 44	5 06	5 28					21
12	3 39	3 52	4 08	4 27	4 50	5 13					18
15	3 22	3 34	3 50	4 09	4 33	4 56					15
18	3 05	3 16	3 32	3 51	4 15	4 39					12
21	2 47	2 57	3 13	3 33	3 57	4 21					9
24	2 28	2 38	2 54	3 15	3 38	4 03					6
27	2 09	2 19	2 35	2 56	3 19	3 44					3
Signe 11	1 50	1 59	2 16	2 36	3 00	3 25					Signe 1
3	1 31	1 40	1 56	2 16	2 40	3 06					27
6	1 11	1 21	1 35	1 56	2 21	2 46					24
9	0 52	1 01	1 15	1 36	2 00	2 26					21
12	0 33	0 40	0 54	1 15	1 39	2 05					18
15	0 14	0 20	0 35	0 54	1 18	1 45					15
18	♌ 0 06	♌ 0 00	♌ 0 14	0 34	0 58	1 25					12
21	0 26	0 20	0 07	♌ 0 13	0 37	1 04					9
24	0 45	0 40	0 27	0 08	♌ 0 16	0 42					6
27	1 05	1 01	0 48	0 29	0 05	0 21					3
Signe 12	1 24	1 21	1 08	0 49	0 25	0 00					Signe 0
	4 0	3 24	3 18	3 12	3 6	3 0					
The Anomalie of the ☾	s d	s d	s d	s d	s d	s d					The Anomalie of the ☾
	Adde	Adde.	Adde	Adde	Adde.	Adde					

The mean distance of the ☾ from the ☉, or from his ☌.

A Table of the reduction of the Moon from her proper Orbe to the *Ecliptick*.

Degrees	Sign 0 Sign 6		Sign 1 Sign 7		Sign 2 Sign 8		Degrees
	Adde.		Adde		Adde.		
	°	′	′	″	′	″	
1	0	15	6	12	5	57	29
2	0	30	6	18	5	48	28
3	0	45	6	24	5	39	27
4	0	59	6	29	5	30	26
5	1	13	6	35	5	21	25
6	1	27	6	40	5	12	24
7	1	42	6	44	5	01	23
8	1	56	6	47	4	51	22
9	2	10	6	51	4	40	21
10	2	24	6	54	4	29	20
11	2	38	6	56	4	18	19
12	2	52	6	57	4	07	18
13	3	06	6	58	3	55	17
14	3	16	6	59	3	42	16
15	3	19	7	00	3	31	15
16	3	32	6	59	3	18	14
17	3	43	6	58	3	05	13
18	4	56	6	57	2	51	12
19	4	08	6	56	2	38	11
20	4	19	6	54	2	23	10
21	4	30	6	51	2	09	9
22	4	41	6	47	1	55	8
23	4	52	6	44	1	41	7
24	5	02	6	40	1	26	6
25	5	13	6	35	1	12	5
26	5	22	6	29	0	58	4
27	5	31	6	24	0	45	3
28	5	49	6	18	0	30	2
29	5	58	6	12	0	15	1
30	6	06	6	06	0	00	0
Degrees	Substr.		Substr.		Substr.		Degrees
	Sign 5 Sign 11		Sign 4 Sign 10		Sign 3 Sign 9		

A Table of the Moons Latitude.

South. / North.	Signe 3 / Signe 9			Signe 4 / Signe 10			Signe 5 / Signe 11			Descen / Ascend
Degrees.	Latitude of ☾			Latitude of ☾			Latitude of ☾			Degrees
	D	′	″	D	′	″	D	′	″	
0	0	0	0	2	29	52	4	19	43	30
1	0	5	14	2	34	22	4	22	18	29
2	0	10	27	2	38	50	4	24	49	28
3	0	15	41	2	43	15	4	27	14	27
4	0	20	54	2	47	37	4	29	34	26
5	0	26	7	2	51	56	4	31	50	25
6	0	31	19	2	56	11	4	34	0	24
7	0	36	31	3	0	24	4	36	6	23
8	0	41	42	3	4	33	4	38	6	22
9	0	46	52	3	8	39	4	40	2	21
10	0	52	2	3	12	42	4	41	52	20
11	0	57	10	3	16	41	4	43	37	19
12	1	2	18	3	20	36	4	45	17	18
13	1	7	24	3	24	28	4	46	52	17
14	1	12	29	3	28	16	4	48	21	16
15	1	17	33	3	32	0	4	49	45	15
16	1	22	36	3	35	40	4	51	4	14
17	1	27	37	3	39	17	4	52	17	13
18	1	32	36	3	42	49	4	53	26	12
19	1	37	34	3	46	17	4	54	29	11
20	1	42	30	3	49	42	4	55	26	10
21	1	47	24	3	53	2	4	56	18	9
22	1	52	16	3	56	17	4	57	4	8
23	1	57	6	3	59	29	4	57	45	7
24	2	1	54	4	2	36	4	58	21	6
25	2	6	39	4	5	38	4	59	51	5
26	2	11	23	4	8	37	4	59	16	4
27	2	16	4	4	11	30	4	59	35	3
28	2	2	42	4	14	19	4	59	49	2
29	2	25	18	4	17	4	4	59	57	1
30	2	29	52	4	19	43	5	00	00	0
Degrees.	D	′	″	D	′	″	D	′	″	Degrees
South. / North.	Signe 8 / Signe 2			Signe 7 / Signe 1			Signe 6 / Signe 0			Ascend. / Descen.

A Table of the exceſſe or diverſity of the Moons Latitude.

The true Anomalie of the ☾ Latitude.	The mean diſtance of the ☾ from the ☉, or from his ☌.												The true Anomalie of the ☾ Latitude.
	Signe 0			Signe 1			Signe 2						
	10	20	30	10	20		10	20	30				
	Adde	Adde	Adde	Adde	Adde		Adde	Adde	Adde				
	′ ″	′ ″	′ ″	′ ″	′ ″	″	′ ″	′ ″	′ ″				
Signe 0-6	0 40	2 23	4 49	7 28	10 11	12 36	14 24	15 25	16 5				Sign-6-12
10	0 39	2 21	4 44	7 20	10 1	12 24	14 14	15 6	15 49				20
20	0 37	2 15	4 31	7 00	9 34	11 50	13 35	14 25	15 6				10
Sign -1-7	0 35	2 4	4 10	6 28	8 50	10 55	12 32	13 18	13 56				Sign-5-11
10	0 31	1 50	3 41	5 42	7 48	9 39	11 4	11 45	12 18				20
20	0 26	1 32	3 6	4 48	6 34	7 7	9 19	9 55	10 21				10
Sign.-2-8	0 20	1 11	2 24	3 43	5 6	6 19	7 15	7 44	8 3				Sign-4-10
10	0 13	0 49	1 39	2 33	3 31	4 20	4 59	5 22	5 32				20
20	0 7	0 25	0 51	1 17	1 47	2 13	2 32	2 41	2 49				10
Sign.-3-9	0 00	0 00	0 00	0 00	00	00	00	00	00				Sign-3-9
	20	10	00	20	10	00	20	10	00				
	Signe 5			Signe 4			Signe 3						

CHAP. XI.

How to finde the mean Syzygia *(or Conjunction) of the* Luminaries.

THis precept is of great uſe, eſpecially in the Calculation of the Eclipſes of the Sun and Moon, as afterwards more fully will appeare. The manner of the Calculation is thus.

Firſt, at the beginning of the Moneth given, compute the meane longitude of the Moon from the Sun, which if it ſhall be exactly 12 Signes, the middle time of the New Moon falleth in the Meridian of the firſt day of the moneth given; but if it be leſſe then 12 Signes, then take the ſame from 12 Signes (that is from the whole Circle) and the Reſidue convert (by the Canon of the longitude of the Moon from the Sun) into days and minutes of the day, which adde to the beginning of the moneth, and there will ariſe the true time of the middle of the New Moon in the Yeare and Moneth given.

EXAMPLE, I deſire to know the mean time of the New Moon in *March* 1652. Firſt, I calculate the middle motion of the Moon from the Sun in the Meridian of the firſt day of that moneth, finding it to be 0 Signes 18 deg. 16′ 30″, and becauſe it is leſſe then 12 ſignes, I take it from the whole Circle, and there remaineth 11 ſignes, 11 deg. 43′,30″, which arch the ☾ runneth in 28 days, 0 hou. 1′,53″, that is in time 28 days, 0 houres, 45′,21″, therefore the mean time of the New Moon in *March*, 1652, will be the 28th. day, 0 houres, 45′,21″.

Now to finde the time of the mean Ful-moon next following, add to the New-moon given the half *Syzygia*, 14 dayes, 18 h. 22′. 2″. and you ſhall have the true time of the mean Ful-moon ſucceeding, *viz* *April* 12th, 19 h. 17′. 23″.

Finally, If you would know the the times of the New or Ful-moons in the following moneths, add to the time given of the New or Ful-moon, the time of the half *Syzygia* 14 days, 18 h. 22′. 2″. and you ſhall have the equall time of the New-moon next following: and thus may you proceed from New-moon to Ful-moon, and from Ful-moon to New-moon at pleaſure.

CHAP. XII.

To finde the true hourely motion of the Moon from the Sun in the New and Ful-moons.

ENter the Table of the hourely motion of the Moon from the Sun in the New and Ful-moons, finding her diſtance from the Sun in the head of the Table, and her *Anomalie* in the firſt or

ſixt

sixt Column, or if you find her distance from the Sun, or from his Opposition in the bottom of the Table, then finde her *Anomalie* in the last Columne, and in the Common Angle you shall forth-with finde the hourely motion of the Moon from the Sun.

EXAMPLE, It is required to finde the true hourely motion of the Moon from the Sun at the time of the mean Ful-moon 1649, *May* 15, at $16^h.41'.27''$. the distance of the ☾ from the ☉ then being six signes, and her *Anomaly* 6 Signes, 27 deg. $41'.18''$. with which I enter the Table (as before is taught) and I finde her true hourely motion to be $33'.44''$.

CHAP. XIII.

To finde the time of the true Syzygia *having the time of the mean* Syzygia *given.*

TO the time of the mean *Syzygia* supputate the true motion of the Sun and Moon, and by their *Anomalies* gather their *Æquations*, by which you may know whether the true *Syzygia* precede, or succeed the mean, for if the *Prosthapheresis*, or *Æquation* both of the Sun and Moon shall be of the same species, and shall be equall (which seldom hapneth) then the time of the meane and true Conjunction falleth together at that very moment, but if their *Æquations* shall be unequall, and of divers denominations (*viz.* the one added and the other substracted) add into one sum their *Æquations*, or if both be of the same denomination and species, then substract the lesser from the greater, and note the difference; and this sum or difference divided by the true hourely motion of the ☾ from the ☉, giveth the interval, or distance between the mean *Syzygia* & the true, (which never exceedeth 14 hours) add this to the time of the mean *Syzygia*, if the place of the ☾ precede the place of the ☉, or deduct the same from the time of the mean *Syzygia*, if the place of the ☾ follow the place of the ☉, and you shall have the time of the true *Syzygia* wel-nigh: To which time compute the true motions of the ☉ and ☾, and if there places agree exactly, you have the accurate moment of the true *Syzygia*, but if there be some difference of minutes (which oftentimes hapneth) then divide the same by the true hourely motion of the ☾ from the ☉ at that moment, and the quotient adde to, or substract from the time of the true *Syzygia* before found (according as the place of the Moon precedes, or succeeds the place of the Sun) and you shall have the exact time of the true *Syzygia* of the Luminaries.

Ex-

EXAMPLE. The meane Opposition of the *Luminaries* in *May* 1649. is 15 dayes, 16 h, 41′, 27″, the time of the true Opposition being desired. First, to the time of the meane Opposition, I compute the true motion of the Sun and Moon, finding the Suns motion to be 2 s, 5 d, 10′, 21″, and the Moons 8 s, 6 d, 34′, 44″, and because the ☉ Æquation is 1 d, 4′, 3″, to be added, and the Moons 2 d, 28′, 26″, likewise to be added, therefore in regard they are of the same Denomination, I substract the lesser from the greater, and the difference of the said Æquations, is the distance of the true Opposition from the meane, *viz*, 1 d. 24′, 23″, and this being parted by the true hourely motion of the Moon from the Sunne 33′, 44″, there commeth 2 h. 30′, 10″, which I deduct from the meane Opposition, in regard the place of the Moon followes the place of the Sun, and there remaineth 15 days, 14 h. 11′, 17″, the time of the true Opposition, *quam proxime*. To this time I, againe, compute the true motions of the Sun and Moon, and I finde the Suns place in ♊ 5 d, 4′, 22″, and the Moone in ♐, 5 d, 3′, 51″, the difference is 31″, and this I divide by the true corrected hourely motion of the Moone from the Sun, 33′, 48″, and the quotient is 55″, which I adde to the former time, because the place of the Moone precedes the place of the Sun, and there emergeth the time of the true Opposition, *May* 15 day, 14 h, 12′, 12″, at which time I, againe, compute the true motion of the *Luminaries*, and I finde the Sun in ♊ 5 d, 4′, 21″, and the ☾ in ♐ 5 d, 4′, 21″, and seeing their places agree exactly, I conclude the time of the true Opposition is exactly obteined.

CAP. XIV.

Of the Æquation of time for the inequalitie of naturall dayes.

FOr the *Æquation* of naturall dayes, which are unequall, in respect of the diversity of the Sunnes motion, it will heere be requisite to shew you the manner how to finde the said *Æquation*, which is the difference betweene the equall and apparent time.

Enter the Table following of the *Æquation* of time, entituled, *A Table of the Æquation of time, for the inequality of naturall dayes*, finding the signe of the Suns place, in the Head or Foot, and the degrees in the first Columne on the left hand, or on the right, (according as you finde the Signe) and in the angle of meeting you shall have the *Æquation* desired.

EXAMPLE. I would know the said *Æquation* the aforesaid 15

of

of *May*, 1649 at $14^h, 12', 12''$, the Suns place is then ♊ $5^d, 4', 21''$, with which enter the Table, as before is taught, and forthwith you shall finde the said *Æquation* to be $7', 50''$, to be added, therefore the apparent time is, $14^h, 20', 2''$.

CHAP. XV.

To finde the apparent Semidiameters *of the Sunne, Moon, and shaddow of the Earth, in the new and full Moones.*

TO find the Suns apparent Semidiamer, you must first find his *Anomalie*, with which enter the Table of the Semidiameter of the Sun, and you shall have his Semidiameter. Then enter the Table of the Semidiameter of the ☾, and the shaddow, finding the mean distance of the Moone from the Sunne, on the head of the Table, and her *Anomalie* in the first, or sixth Columne, but if you finde her said distance in the foot, then finde her *Anomalie* in the fifth or last Columne, and in the Common angle, you shall have the Semidiameter of the Moon; in like manner enter the Table of the Semidiameter of the shaddow of the Earth, and you shall have the Semidiameter thereof *in Loco transitus Lunæ*. Afterwards, with the *Anomalie* of the Sun, enter againe the Table of the Semidiameter of the Sun, and you shall have the variation of the Shaddow, in the Columne whose Title is, *Variation of the shadow*, which alwaies take from the Semidiameter of the shadow [illegible] *transitus Lunæ*, and you shall have the true corrected Semidiameter of the earths shaddow.

EXAMPLE. In the yeare 1649. *May* 15. $14^h, 20', 1''$. I would know the ☉ apparent Semidiameter: the ☉ *Anomalie* is $10^s, 27^d, 26', 24''$, and therefore his apparent Semidiameter is $15', 3''$.

Againe, at the same instant, it is required to finde the Semidiameter of the Moone and shaddow of the Earth: therefore I enter their respective Tables, as before is taught, and I finde the Semidiameter of the Moon to be $17', 11''$, and the Semidiameter of the shaddow of the Earth at the same instant $46', 41''$.

Finally, with the *Anomalie* of Sun, I gather the variation of the shaddow $3''$, which I deduct from the Semidiameter of the shaddow $46', 41''$, and there remaineth the true corrected Semidiameter of the shaddow $46', 38''$, which was sought for.

CHAP.

CHAP. XVI.

To finde when the Moone will be Eclipsed, and when not.

BEfore wee proceed to calculate the Eclipse, it will first be requisite to know, whether there will be an Eclipse, or no, if it appear there will be none, then what needs any Calculation? if there be, wee may proceed with pleasure. The Rules ensue.

Rule I. the middle motion of her latitud

If at the time of the meane full Moone, her middle place be distant from either of the *Nodes* lesse then 15 deg. 12′ either according, or contrary to the succession of the Signes, that full Moon shall be Eclipsed.

EXAMPLE, The meane time of the full Moone in *May* 1649 is 15 dayes, 16 ᵈ. 41′ 27″, at which time, the middle motion of the Moones Latitude is 2ˢ, 28 ᵈ, 3′, 41″. So that between the place of the Moone and her North *Node*, is but one ᵈ, 56′, 19″, therefore, we conclude, the said full Moone will be Eclipsed.

Rule II.

If at the time of the true full Moone, her Latitude be lesse then the Summe of the Semidiameters of the Moone and the Earths shaddow, the Moone will suffer an Eclipse, but if greater she cannot be Eclipsed at that full.

EXAMPLE, In the said Eclipse, where at the time of the true full Moone, her Latitude is 5′, 7″ North, and the aggregate of the two Semidiameters is 63′, 39″; therefore because the Moons Latitude is lesse then the said Aggregate, I pronounce that the said full Moone will be Eclipsed.

CHAP. XVII.

To finde how many Digits the Moone shall be Eclipsed.

FOrasmuch as the apparent Diameter of the Sunne and Moone doth seeme to the eye to be about three palmes, or hands breath, therefore the Ancient *Astronomers* have divided their Diameters into 12 equall portions, which they call Digits, or Points, which

which Digits Eclipticall in the Lunar Eclipse, may be obtained after this manner.

Out of the aggregate of the Semidiameters of the Moone, and the shaddow of the Earth, take the minutes of the true Latitude of the Moone, and the Remainder will be the Parts deficient, which divide by the Diameter of the Moone, and then multiply the Quotient in 12 and the Digits Eclipsed will arise. But if the Eclipse be totall with continuance, then deduct the Diameter of the Moone from the parts deficient, and the redsiue divide by the Diameter of the Moone, and the Quotient augment by 12, and then there will arise the just quantity of the Eclipse above 12 Digits, as more plainly by Example will appeare.

EXAMPLE, In the Eclipse of the Moone to be 1649, *May* 15 14^{h}. 20$'$. 1$''$. the true motion of the Moones Latitude, is 2^{s}. 29^{d}. 1$'$. 25$''$, and therefore the true Latitude of the Moone is 5$'$. 7$''$ North, also the apparent Semidiameter of the Moone is 17$'$. 11$''$, and the apparent Semidiameter of the shaddow 46$''$. 38$''$. the aggregate of the said Semidiameters is 63$''$. 49$''$. out of which I take the true latitude of the Moone, 5$'$. 7$''$. and the remainder 58$'$. 42$''$. is called the parts deficient, from which I take the Diameter of the Moone 34$'$. 22$''$. (because the Eclipse is totall with continuance) and there remaines 24$'$. 20$''$. which I divide by the Diameter of the Moon, & the Quotient is, 42^{d}. 28$'$. 59$''$, and this I multiply by 12. and the Product is 8 digits 29$'$. 48$''$. which is the quantity above 12 Digits that the Moone will be darkned, therefore the quantity of the said Eclipse will be 20 digits 29$'$. 48$''$.

CHAP. XVIII.

To finde the minutes and time of incidence, or the halfe continuance of the Moone in the Earths shaddow, called in Latine, Mora dimidia.

IN the partill Eclipse of the Moone, or totall without continuance, resolve the summe of the Semidiameters of the Moon, and shaddow of the Earth, into Seconds, and these Square, or multiply in themselves; in like manner resolve the Latitude of the Moon into Seconds, which likewise multiply in themselves, which done, take the Quadrat of the Moones Latitude, out of the Quadrat of the Semi-

Semidiameters of the Moon and the ſhaddow, and the Radix of the Quadrat remaining ſheweth the ſpace of the Moone in her *propria Orbita*, which ſhe goeth from the beginning of the Eclipſe to the middle, or from the middle to the end, and theſe are called the minutes of Incidence, in Latine, *Scrupula Incidentiæ, vel Caſus*, Finally, theſe *Scrupula Incidentiæ*, being divided by the hourely motion of the Moone from the Sunne, giveth the time of Incidence; and this time of Incidence taken from the time of the middle of the Eclipſe, ſheweth the beginning of the Eclipſe, but being added thereto, it ſheweth the end of the Eclipſe.

But if the Eclipſe be totall with continuance, then tis requiſite to know how long ſhe continueth totally darkned, and when her totall darkeneſſe begins and ends. To doe this, firſt take the difference between the Semidiameter of the Moone, and the Semidiameter of the ſhaddow of the Earth, which reſolve into Seconds, and theſe Seconds multiply in themſelves, and from the Quadrat thereof take the Quadrat of the Moones Latitude, and the Radix of the remainder (being converted into minutes) is *Scrupula moræ dimidiæ*, or the minutes of her halfe tarrience, which being likewiſe divided by the true hourely motion of the Moone, giveth the *tempus moræ dimidiæ*, or the time of the halfe Continuance of the Moone in the ſhaddow of the Earth.

EXAMPLE. In the Eclipſe of the Moone before mentioned, *Anno* 1649. in the moneth of *May*, which will be totall. The ſum of the Semidiameters of the Moone and the ſhaddow is $63'$ $49''$ which being reſolved into Seconds, maketh 3829, the Quadrat whereof is 14661241. alſo the Latitude of the Moone is $5'$ $7''$, which converted into Seconds, maketh 307, whoſe Quadrat number is, 94249. Now taking the Quadrat of the Moones latitude, out of the Quadrat of the two Semidiameters, there remaineth 14566992, the Radix whereof is 3817, therefore the minutes of Incidence, and half tarrience together, are $63^{h}.$ $37''$, which being parted by the true hourely motion of the Moon, $33'.$ $47''$, it giveth the time of Incidence, and half continuance, $1^{h}.$ $52'.$ $59''$ then to find the *Tempus moræ dimidiæ*, or the time of her half ſtay in the ſhaddow, I ſubſtract the Semidiameter of the Moon $17'.11''.$ from the ſemidiamer of the ſhadow $46'.38''$, and the reſidue $29'.27''.$ being converted into ſeconds, make 1767, whoſe Square is 3122289 from which deducting the Quadrat of the Moons latitude 94249, there remaineth 3028040 whoſe Root is 1741 therefore the *Scrupula moræ dimidiæ* are $29'.$ $1''$, which being divided by $33'.$ $47''$,

the hourely motion of the Moon from the Sun, it giveth $51'.32''$, the *Tempus moræ dimidiæ*, or the time of her halfe continuance in the shaddow, which, taken from the *Tempus incidentiæ*, & *moræ dimidiæ*, leaveth the time of incidence $1^h.1'.27''$. So that the duration from first to last will be $3^h.45'.58''$.

Chap. XIX.

To finde the Latitude of the Moone at the beginning and ending of the Eclipse.

Because the Type of the Eclipse of the Moone cannot well be described, except the Moones Latitude at the beginning and ending of the Ecclipse be knowne, it is here expedient to shew you the way, how you may speedily finde the same.

Take the minutes of Incidence, and halfe continuance together, and adde thereto the midde motion of the Sun, agreeing to the time of incidence and halfe continuance, the summe whereof take from the true motion of the Moones Latitude, at the time of the true full Moon, and you shall have the true motion of her Latitude at the time of the beginning of the Eclipse, but adding the same to the true motion of her Latitude at the time of the true full Moone, you shall have the true motion thereof at the end of the Eclipse, by helpe whereof you may finde her true Latitude, as before is taught.

Example. In this Eclipse, the middle motion of the Sunne agreeing to the time of incidence and halfe continuance together, is $4'.39''$, which being added to the minutes of incidence and half continuance $63'.37''$, maketh $68'.16''$, or $1^d.8'.16''$, and this substract from the true motion of her Latitude at the time of the true full Moone, $2^s.29^d.1'.25''$, and there remineth the true motion of her Latitude at the beginning of the Eclipse, $2^s.27^d.53'.5''$. On the contrary, by adding the same to her true motion of Latitude at the time of the true full Moone, it produceth the true motion of her latitude at the end of the Eclipse, $3^s.0^d.9'.37''$. Hence the true latitude of the moone at the beginning is $11'.4''$. North, and at the end $0'.50''$. South.

CHAP. XX.

A generall Rule to presage the Colour of the Moons body at the time of her Eclipse.

ALphonsus, and divers of his followers have delivered to posterity a certain way, to foretell the colour of the Moon when she is eclipsed, which (as they say) is to be known by her true *latitude*, and by her *Anomalie*, or distance of the Moone from the *Apogæon* of

A Table shewing the Colour of the Moons Eclips,

The first part of the Table.

Minutes of the true Latitude of the Moon.	
0, 2, 4, 6, 8	Most Black.
10, 12, 14, 16, 18, 20	Black mixed with some Greennesse.
22, 24, 26, 28, 30	Black with Rednesse.
32, 34, 36, 38, 40	Black with Paleness.
42, 44, 46, 48, 50	A Pale Ash-colour.
52, 54, 56, 58, 60	A white Ash-Colour.

The second part of the Table

The Signes and Degrees of the Moons Anomalie.		The Signes and Degrees of the Moons Anomalie.	
0 0 – 0 10	A Reddish Colour.	12 0 – 11 20	
0 20 – 1 0 – 1 10	A white Ash-colour	11 10 – 11 0 – 10 20	
1 20 – 2 0 – 2 10	An Ash colour.	10 10 – 10 0 – 9 20	
2 20 – 3 0 – 3 10	A pale Black.	9 10 – 9 0 – 8 20	
3 20 – 4 0 – 4 10	Black mixed with Rednesse.	8 10 – 8 0 – 7 20	
4 20 – 5 0 – 5 10	Black mixed with Greennesse.	7 10 – 7 0 – 6 20	
5 20 – 6 0	Pitchy Black.	6 10 – 6 0	

her

her *Epicyle*; therefore (not to use many words) that you may come to the speedy knowledge thereof, there is no more required but that you enter the foregoing Table with the latitude of the Moon in the first part, and with her *Anomalie* in the second Part, so shall you discerne the colour of the Moon in her Eclipse, if you make a perfect mixture, of them: But you may perform the same more perfectly, by mixing together the said colours, as *Painters* use to do, and the colour comming of that mixture, shall be the true colour thereof.

As in the Eclipse of the moon to be in *May* 1649, the true latitude of the moon is 5′, which being entred in the first part of the Table, sheweth the colour of the Eclipse to be *most black*; Secondly, entring with the *Anomalie* of the moon 6°. 26ᵈ. in the other part of the Table, I finde her colour *Black with greenesse*, both which, if they be mixed together will give the true colour of the Eclipse to be *Exceding black with little or no greennesse*.

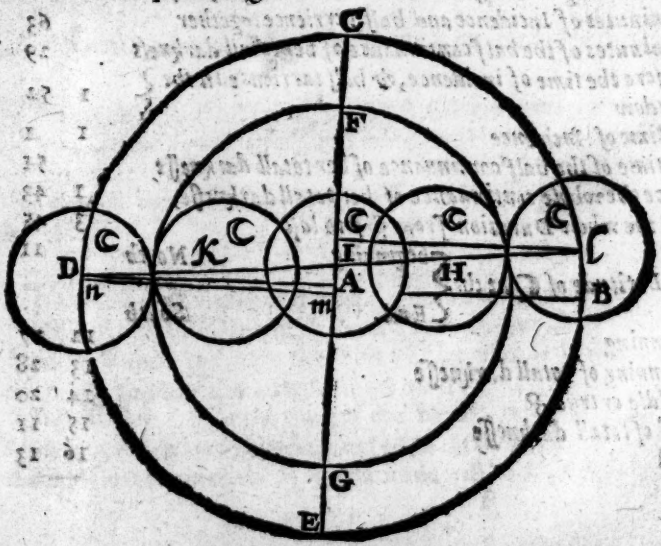
CHAP. XXI.

How to describe the Eclipse of the Moone in plano.

TO delineate and typifie the Eclipse of the Moone *in plano*, it is necessary to have given the Semidiameter of the Moone, the Semidiameter of the Shaddow, and the latitude of the Moon, both to the beginning and ending of the Eclipse, which had, describe 2 orthogonall lines cutting one another in the point *A*. (as you may behold in the following figure) to be of sufficient length for the number of the parts of the aggregate of both the Semidiameters, as *B D*: *E C*. and let *B*. represent the West, *D* the East, *C* the North, *E* the South. Then on the Center *A* describe a Circle, containing the summe of both the Semidiameters, whose Circumference is noted with the Letters *B D C E*. and on the same Center *A*, describe a lesser Circle within the former, containing onely the semidiameter of the shaddow, whose Circumference is *F G*. Finally, upon the line *C E*. note the latititude of the Moone both at the beginning and ending of the Eclipse, numbring it Northward or Southward from the Ecliptique line *B D*. according to the Denomination thereof, drawing parallel lines to the East and West, and at the end of each line make a Marke, and from these marks draw a straight line, which shall present the way of the Moone during the time of the Eclipse, upon which

which line describe 5 Moones, the first in *C*. the second in *H*. the third in *I*. the fourth in *K*. the fifth in *N*. The first towards the West, shewing the beginning of the Eclipse, the second the beginning of totall darkenesse; the third, the middle of the Eclipse, and greatest darkenesse; the fourth, the end of totall darkenesse; and the fifth, and last, the finall end of the Eclipse.

EXAMPLE. In the Eclipse before treated of, the semidiameter of the moon, is 17′, 11″, the semidiameter of the shadow 46′, 38″, the latitude of the moon at the beginning 11′, 4″, North, and at the end 0′, 50″, South, which given, on the Center *A* (the intersection of the two Orthogonall lines) describe a circle conteining the quantity of both the semidiameters of the moon and the shadow 63′-49″. *A D*, and *A B*. and on the same Center *A*, describe another circle, conteining the quantity of the semidiameter of the shadow 46′, 38″, *A F*. Again, in the line *E C*, from the point *A* towards *C*. I note the latitude of the Moon at the beginning of the Eclipse, 11′, 4″ North, drawing the line *I L*, parallel; to *A B*. Also in the line *A G*. from *A*, count the latitude of the Moon in the end of the Eclipse 0′, 50″, South, extending *M N* parallel to *A D*, which done, I draw a straight line from *L* to *N*, which shall represent the way of the moon during the said Eclipse, and lastly, *L* sheweth the place of the moon at the beginning of the Eclipse, *H* her place when she begins to be totally darkned, *I* her place at the middle, *K* her place when she begins to recover light, and *N* the end of the Eclipse, or the time when she recovers her perfect light.

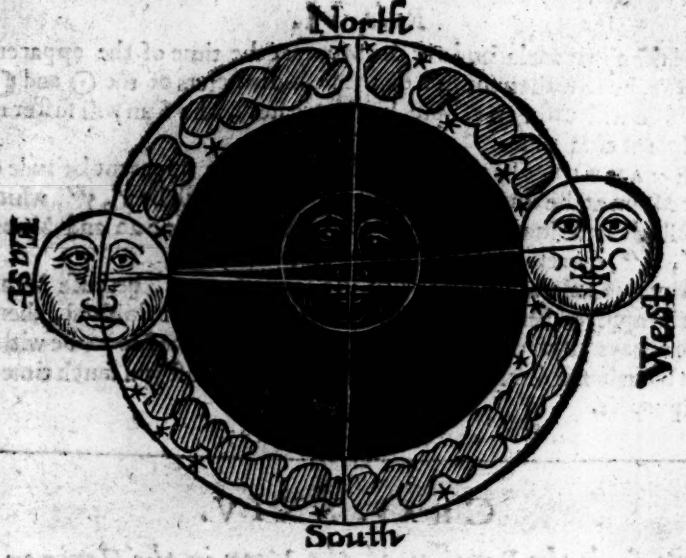


CHAP. XXII.

The Calculation of the said Eclipse of the Moon according to the preceding Rules.

		ho.	′	″
The mean ☌ of the ☉ and ☾	May 15	16	41	27
The Interuall of the mean and true ☌	Subt.	2	29	15
The middle time of the true ☌	May 15	14	12	12
The Æquation of time to be added			7	49
The apparent time of the true ☌	May 15	14	20	1
The Anomalie of the ☉	♉	27	26	24
The Anomalie of the ☾		26	20	00
The mean Distance of the ☾ from the ☌ of the ☉		28	44	8
The true motion of the Moons latitude		29	1	21
Therefore the latitude of the ☾ is	North		1	7
The place of the ☉	♊	5	4	21
The place of the ☾ (neer the Dragons-tail) in	♐	5	4	21
The Semidiameter of the ☾			17	11
The Semidiameter of the shadow			46	41
The Variation of the shadow	Subt.			3
The Semidiameter of the shadow corrected			46	38
The Aggregate of their Semidiameters			63	49
The Parts deficient			58	12
So that the Digits eclipsed will be	20 Dig. 29′	48″		
The minutes of Incidence and half tarrience together			63	37
The minutes of the half continuance of her totall darkness			29	1
Therfore the time of incidence, & half tarrience in the shadow		1	52	59
The time of Incidence		1	1	27
The time of the half continuance of her totall darkneſſe			51	32
Hence the whole continuance of her totall darkneſſe		1	43	4
And the whole Duration from first to last		3	45	58
The Latitude of ☾ at the beginning	North		11	4
The Latitude of ☾ at the End	South			50
Beginning		12	27	1
Beginning of totall darkneſſe		13	28	29
Middle or true ☌		14	20	1
End of totall darkneſſe		15	11	33
End		16	13	00

A Type of the said Eclipse of the Moon.



Chap. XXIII.

To finde whether the Sun shall be Eclipsed, or not.

THere are two Rules used amongst Astronomers, to know when the Sun will be eclipsed, and when not, the one whereof hath bin in great esteem with Antiquity, notwithstanding the other is more exact, but withall more difficult: both which in their order are here set down.

Rule I.

If the middle latitude of the Moon at the time of the mean *Syzyga*, be distant from the North Node lesse then 20 d. 40′. or from the South Node lesse then 11 d. 22′, the Sun may be eclipsed at that Conjunction, but being without these limits, there can be no Eclipse.

Example. At the time of the mean, or equall ☌ of the Luminaries, which is to happen, *Anno* 1652, *Mar.* 29, at 0 h. 45′. 21″, the middle motion of the Moons latitude will be 9 s, 6 d. 51′, 55″, &

therefore will be distant from the North-node, $6^d.51', 55''$, from which I gather the Sun will be eclipsed at that Conjunction.

Rule II.

If the apparent latitude of the Moon at the time of the apparent *Synode*, be lesse then the sum of the Semidiameters of the ☉ and ☾, the Sun will suffer an eclipse, but if greater, the Sun will suffer no eclipse at that time.

EXAMPLE. In the aforesaid Eclipse, the apparent latitude of the Moon at the time of the apparent Synod, will be $2', 5''$, which is lesse then the summe of the semidiameters of the Sun and Moon, $32', 13''$, therefore the Sun will be eclipsed.

But this rule is not of so much use as the former, because it cannot be applyed before the calculation be in a manner finished, therefore always make use of the former, and be sure the Moon be within the bounds and limits of the Ecliptick, lest it cost you much time to no purpose.

CHAP. XXIV.

To finde the Parallax of the Moon in the Horizon.

TAke the distance of the Moon from the Sun, and her Anomaly, finding her distance from the Sun in the head of the Table, and her Anomaly in the first or fifth Columne, or if you finde her distance from the Sun, or from his ☌ in the bottom of the Table, then finde her Anomalie in the fift or last Columne, and in the common angle you shall have her Parallax in the Horizon.

EXAMPLE. In the Eclipse of the Sun to be 1652, the mean distance of the Moon from the ☌ of the Sun is $5^s, 28^d.28' 24''$, and the *Anomalie* of the Moon $7^s, 12^d, 32', 54''$, and because I finde the distance of the Moon from the ☌ of the Sun in the bottom of the Table, I therefore finde her *Anomaly* in the fifth Column ascending, and in the common *Area*; I have her Parallax in the *Horizon* $62', 4''$, or $1^d, 2', 4''$, and here you must observe, that though you finde not the just degree, of her distance, nor *Anomaly*, yet you must make proportion, and the truth will appeare.

CHAP.

Chap. XXV.

To find the Altitude of the Luminaries above the Horizon.

According to the doctrine of Spherical Triangles Oblique angles, the altitude of the Sun or Moon may ſpeedily be obteined, as is taught in the 8 Chap. Part 6 of this Book, where according to the ſame doctrine are calculated three Tables of the Suns Altitude, namely, for the latitude of 50^{d}, 52^{d}, and 54^{d}. but becauſe you are there taught how to perform the ſame by the admirable Canon of Logarithmes, we will here annex the operation fitted to our preſent purpoſe, namely, for the finding the Suns altitude the ſaid 29 of *March*, 1652, at 9^{h}.51$'$, *A.M.* it being the apparent time of the true Conjunction of the Luminaries in our Meridian.

1	*As the Radius* 90 *deg.*	10,00000
	Is to the Coſine of the angle given 32^{d}. 15$'$.	9,92723
	So the Tang. of the Complement of the Elevation 37^{d}.19$'$,	9,88210
	Aggr.	19,80933
	To the Tangent of 32 *deg.*48^{t}.30$''$.	9,80933

2	*As the Coſine of* 32^{d}.48$'$,39$''$.	9,92493
	To the Coſine of 49^{d}.37$'$,52$''$.	9,81138
	So the Sine of the Elevation 52 *deg.*41$'$.	9,90053
	Aggr.	19,71191
	To the Sine of the Suns altitude 37^{d}.47$'$,55$''$.	9,78738

Chap. XXVI.

Having the Parallax of the Moon in the Horizon, and her Altitude above the Horizon, to finde her Parallax in the Circle of Altitude.

From the Sine of the Sun or Moons Altitude, take the Sine of there Horizontal-parallax, and then ſay, as the Remainder is to the Coſine of their Altitude, ſo is the Radius to the Tangent of an Arch, out of which taking the arch of the Complement of their Altitude, it leaveth the Parallax of the Moon deſired.

The Cosine of the altitude of the Luminaries, 37 d. 47′, 55″,	79018
The Sine of their altitude, 37 *deg.* 47′, 55″.	61289
The Sine of the Parallax of the ☾ *in the Horizon,* 62′. 4″.	805
[Ex Tab. Nap.]	*Rest.* 59484

Then say

As 59484, is to 79018, so is the Radius 100000 to the Tangent 132839, whose arch is 53 d. 1′, 40″. from which deducting the Complement of their Altitude 52 d. 12′, 5″. there remains the Parallax of the Moon desired, 49′, 35″.

But if the parallax of the Sun be desired, you may by the Table of the Parallax of the Sun finde his Parallax, by knowing his Altitude, as in this Example, the Altitude of the *Luminaries* being 37 d. 47′, 55″. therefore his parallax is 2′, 21″. which taken from the parallax of the Moon 49′, 35″, there remaineth 47′, 14″. the Parallax of the Moon from the Sun in altitude.

Chap. XXVII.

Having the right Ascension of the Sun, and the houre of the day, to finde the Point ascending.

TO the right Ascension of the Sun add the time afternoon (being reduced into degrees of the *Æquator*) and to the aggregate thereof add the Radius 90 degrees, so shall the product be the oblique ascension of the point ascending, by help whereof you may by the *Tables* of *Oblique Ascensions*, finde the point rising in any Latitude desired: But for those that cannot conveniently meet with the said *Tables*, let them use the *Table* of Houses in this Book, which serveth for the elevation of 52 degrees, or rather those in *Maginus*, *Origan*, *Argoll*; or else *Modronus* his new *Tables*, *de Directionibus*, which are exactly composed for sundry degrees of Latitude.

Example. It is required to finde the point ascending at the apparent time of the true Conjunction in *March* 1652, which is at 9 h. 51′ *A. M.* the Suns right ascension is then 17 d. 46′. to which adding the time afternoon, being reduced into time (*viz.* 327 d. 45′. together with the Radius 90 degrees, there emergeth 75 d. 31′, the whole Circle being deducted, which in the *Table of oblique Ascensions*, for the latitude of 52 d. 41′. giveth in the ascendent ♋ 16 d. 55′. *ferè.*

Chap.

CHAP. XXVIII.

To know whether the Conjunction of the Luminaries happen in the Orientall, or Occidentall Quadrant of the Signifer.

HAving found the ſigne and degree aſcending by the laſt Chapter you muſt then deduct the ſigne and degree of the Conjunction from the ſame, and if the Reſidue be leſſer then 90 degrees, that Conjunction hapneth in the Orientall Quadrant, but if greater it falleth in the Occidentall Quadrant of the *Signifer*.

EXAMPLE, At the apparent time of the true Conjunction of the Luminaries to be 1652, *March* 29, at $9^{h}.51'$. *A. M.* the Aſcendent is then in ♋, $16^{d}.55''$, from which ſubduct the place of the Luminaries; ♈ $19^{d}.16'$. and the Reſidue is $87^{d}.39'$, which becauſe it is leſſer then 90^{d}. you may conclude the ſame Conjunction hapneth in the Orientall Quadrant of the *Signifer*, and becauſe their diſtance from the Aſcendent is greater then her Altitude, ſhe hath parallax both of longitude and latitude according to *Conſect.* 2. *Ch. ſeq.*

CHAP. XXIX.

Having the Altitude of the Luminaries, and their diſtance from the Point riſing or ſetting, to finde the Parallacticall angle.

THis operation may be performed with moſt eaſe by the admirable *Canon* of *Logarithmes*, by reaſoning thus; As the Tangent of the Diſtance of the Luminary from the Point aſcending, or deſcending, is to the Radius, ſo is the Tangent of their Altitude, to the Coſine of the angle ſought for.

The Tang. of the diſtance of the Luminary from Aſ. $87^{d}.39'$, 11,38681
The Radius 90 *degrees* 10,00000
The Tang. of the Altitude of the Luminaries $37^{d}.47',57''$, 9,88967
Aggr. 19,88967
The Coſine of the Parallactical-angle deſired $88^{d}.10',33''$, 8,50286

Conſect. 1.

If the diſtance of the Moon from the Point aſcending, or deſcending be leſſe then her altitude, there is then no parallax of Latitude, but onely of Longitude.

Con-

Consect. 2.

If the distance of the Moon from the point ascending, or descending, be greater then her altitude, the Moon then hath parallax both of Longitude and Latitude.

Consect. 3.

If the distance of the Moon from the said point be just 90 degrees, then there is no parallax of Longitude, but onely of Latitude.

Consect. 4.

In the Northern Signes the Moon hath greatest parallax above the Horizon, in the Southern Signes under the Horizon, in the Æquinoctiall in the Horizon.

Consect. 5.

All places that have above 30 degrees of Latitude (that is, those that are beyond the second Climate) the parallax of the Moon is always South, whence it is that to us the visible place of the Moon always appears more South then her true place.

Chap. XXX.

Having the Parallax of the Moon from the Sun in altitude, and the Parallactical-angle, to finde the Parallax of the Moon from the Sun, both in Longitude and Latitude.

THe Parallax of the Moon from the Sun in longitude may speedily be obteined by adding the artificiall Tangent of the Parallax of the Moon from the Sun in altitude, to the Cosine of the Parallactical-angle, and from the aggregate thereof, deducting the Radius, so shall the remainder be the Parallax of the Moon from the Sun in Longitude.

But to finde the parallax of the Moon from the Sun in latitude, add the Sine of the Parrallactical-angle, to the Sine of the parallax of the Moon from the Sun in altitude, and from the aggregate thereof deduct the Radius, so will the remainder be the Sine of the parallax of the Moon from the Sun in latitude, as by the ensuing opperations perspicuously may appear.

1 { *As the Radius 90 degrees* — 10, 00000
Is to the Tangent of the parallax of the ☾ from the ☉ in altitude 47′, 16″. — 8, 13800
So the Coſine of the Paralactical-angle 88d.10′,33″, — 8, 50286
Aggreg. 16, 64086
To the Tang. of the Parallax. of ☾ frō ☉ in long. 1′,30″, 6, 64086

2 { *As the Radius 90 degrees* — 10, 00000
To the Sine of the paralactical angle 88d.10′.33″. — 9, 99978
So the Sine of the parallax of the ☾ from the ☉ in latitude 47′.16″. — 8, 13796
Aggregat. 18, 13774
To the Sine of the par. of ☾ from ☉ in lat 47′.13″. 8, 13774

CHAP. XXXI.

To finde the Intervall, or ſpace between the true and apparent Synode of the Luminaries.

THis precept ſerveth chiefely to deſcrie the time of the Sunnes Eclipſe, and to enucleate the very moment of the viſible Synode, wherein though there ſeem to be ſome difficultie, yet by helpe of theſe inſtructions, it may be underſtood with eaſe, and be performed with a deale of pleaſure, but to proceed.

Firſt, learne by *Chapter* 26 of this part, if the Conjunction of the Luminaries happen between the Aſcendent and the 90th. degree of the Ecliptique, then the viſible Conjunction precedes the true, as much as the Parallax in longitude commeth unto, but if the Conjunction of the Luminaries be in the Occidentall Quadrant (that is Weſt from the 90 degree) then the viſible Conjunction ſhall follow the true, according to the proportion of the Parallax in longitude: and that you may know how much the viſible Conjunction precedes or followes the true, you muſt get the true hourely motion of the Moone from the Sunne, next you muſt obſerve, whether the Eclipſe happen in the Orientall, or Occidentall Quadrant of the *Signifer*: If it happen in the Orientall, and the Parallax of longitude decreaſe, ſubſtract the difference of the Parallax of longitude in one houre (or halfe houre) from the true hourely (or halfe hourely) motion of the Moone from the

the Sunne, but if the *Parallaxis Longitudinis* increaſe, adde the ſaid difference.

Againe, if the true *Syzygia* happen in the Occidentall Quadrant and the *Parallexis Longitudinis* decreaſe, add the difference of the *Parallexis Longitudinis* to the true hourely, (or half hourely) motion of the Moone from the Sunne; otherwiſe ſubſtract the ſame from the true hourely motion if the *Parallexis Longitudinis* increaſe.

Finally, If the true conjunction happen in the 90 degree of the Ecliptique, then the true and viſible Conjunction conveene together, and there is then no Intervall or Space between the true and apparent Conjunction, in which caſe the former part of the Eclipſe happeneth in the Orientall Quadrant, and the latter part in the Occidentall, therefore take the difference of the *Parallaxis longitudinis* from the true hourely motion of the Moone from the Sun, and the remainder ſhall be the apparent hourely motion. Having thus found out the apparent hourely motion of the Moone from the Sun, and the *Parallexis Longitudinis* of the Moon from the Sunne at the time of the true Synode, marke if the *Parallaxis Longitudinis* be leſſe then the hourely motion ſeen, if ſo, divide the ſame by the hourely motion ſeene, and the Quotient will give the intervall, or ſpace betweene the true and apparent Synode, to be ſubſtracted from the time of the true Synode in the Orientall Quadrant, and to be added in the Occidentall. But if the *Parallaxis longitudinis* be greater then the hourely motion of the Moone from the Sunne ſeene, firſt, take the the hourely motion ſeen out of the *Parallaxis longitudinis*, and the reſidue divide by the hourely motion of the Moone from the Sunne ſeene, for the houre wherein it falls, and you ſhall have the ſpace of time above one houre, between the true and apparent Conjunction, either to be added to the time of the true Conjunction, or to be ſubſtracted from the ſame, according as it happens in the Orientall. or Occidentall Quadrants, as appeares above.

EXAMPLE, In the year 1652, *March* 29, at 9 houres, 51′, *A. M.* the true hourely motion of the Moone from the Sunne is 33′. 5″. and the *Parallaxis longitudinis* 1′. 30″. and becauſe that according to the 26 *Chap.* of this part, this Ecliptieall Conjunction falleth in the Orientall Quadrant, therefore, againe get the *Paralaxis Longitudinis* to 15′, of an houre ſooner (the reaſon is, becauſe the *Parallaxis Longitudinis* at the time of the true conjunction is leſſe then the motion of the Moon from the Sun ſeene, agreeing to 15′. of an houre) which I finde to be 3′,15″, the difference

of

of the *Parallaxis longitudinis* is 1′, 45″, to be deducted from the true motion of the ☾ from the Sun, agreeing to 15′ of an houre, therefore the motion of the Moone from the Sun seen, agreeing to 15′ of an houre, is 6′, 31″. Now take the *Parallaxis longitudinis* of the Moon from the Sun, at the time of the true Conjunction 1′, 30″, which divide by the apparent motion of the Moone from the Sun 6′, 31″, and the Quotient is 3′, 27″, the intervall of the true and visible Conjunction, to be substracted from the time of the true Conjunction, because (as is said above) the Conjunction happeneth in the Orientall Quadrant, before the 90 degree, therefore the time of the middle of the Eclipse and greatest obscuration will be at 9 h, 47′, 33″, in the morning. And that you may know whether this be the exact time of the visible Conjunction, or no, it is expedient to Calculate the *Parallaxis longitudinis* of the ☾ from the Sun at the time of the visible Conjunction, for if it shall be equall to the Evection, or distance of the Sun and Moone, found by the houre-ly motion of the Moon from the Sun, then the apparent Conjunction is truly found, but if otherwayes, the Calculation is to be corrected.

Example. In the fore-mentioned Eclipse to be 1652, *March*, 29. at 9 h, 47′, 33″, *A. M.* I finde the *Parallaxis longitudinis* of the Moone from the Sun to be 1′, 55″, and the Evection, or distance of the Moone from the Sun to be also 1′, 55″, and because they are equall, I conclude the time of the visible Conjunction is precisely found.

Chap. XXXII.

To finde the true Latitude of the Moone at the time of the apparent Syzygia.

If the Eclipse of the Sun happen in the East part of the *Signifer*, take the summe of the *Parallaxis longitudinis*, and the equall motion of the Sun agreeing to the time of the intervall of the true and visible conjunction, and substract the same from the true motion of the Moones latitude at the time of the true Conjunction, and you shall have the true motion of the Moones latitude at the time of the apparent Conjunction. But if the Eclipse happen in the Occidentall Quadrant, or West part of the *Signifer*, adde the said summe of the *Parallaxis longitudinis*, and meane motion of the Sun, for the intervall of the true and visible Conjunction, to the true motion of the Moones latitude at the time of the true *Synode*, and you shall

have the true Coequate motion of the Moones latitude, at the time of the apparent Synode, by which, according to *Chap.* 7. of this second Part, you shall have the true latitude of the Moone.

EXAMPLE. In the said Eclipse, where the true motion of the Moones latitude at the time of the true *Syzygia*, is 9 ˢ, 8 ᵈ, 44′, 7″, and it is required to know the true motion of her latitude at the time of the apparent *Syzygia*. At the time of the apparent *Syzygia*, the *Parallaxis longitudinis* is 1′, 55″, and the meane motion of the Sunne for the intervall of the true and visible conjunction is 8″, the summe whereof is 2′, 3″, which deduct from the true motion of the Moones latitude at the time of the true *Syzygia*, and the Remainder is the true motion of the Moones latitude at the time of the apparent *Syzygia*, *viz.* 9 ˢ, 8 ᵈ, 42′, 4″.

CHAP. XXXIII.

To finde the apparent Latitude of the Moone at the time of the visible Synode.

AT the time of the apparent *Syzygia* (or Synode) finde the *Parallaxis latitudinis* of the Moone by *Chap.* 29. and the true latitude of the Moone by *Chap.* 32. then consider if they be of the same affection, or no, if it appeare they be, adde the Moones Parallax and her latitude together; but if they be of divers denominations, take the lesser from the greater, for so the Aggregate, or the residue will shew the apparent latitude of the Moone at the visible Conjunction, either Northward, or Southward, which you may know by the propriety of the greater number, that is, the Latitude of the Moone seene, will be of the same kind that the greater number is of, &c.

EXAMPLE. The *Parallaxis longitudinis* of the Moone from the Sunne, at the middle of the said Eclipse 1652. *March* 29. at 9 hou: 47′, 33″, will be 47′, 25″, South, and the true latitude of the Moone 45′, 20″ North, and because they are of divers denominations, I take the lesser from the greater, and the residue will be the *Latitudo Lunæ visa*, or the apparent latitude of the Moone 2′, 5″, South, which is knowne to be South, because her Parallax in Latitude towards the South, exceeds her Northerne latitude.

CHAP.

Chap. XXXIV.

To finde how much the Sun will be darkned.

From the aggregate of the ſemidiameters of the ☉ and the ☾, deduct the *latitudo apparens* of the ☾, and the Remainder ſhall be the *pars deficiens*, or the part darkned of the ☉ Diameter, which being gotten, you muſt divide the *pars deficiens*, by the Diameter of the ☉, and the *Quotus* increaſe by 12, then will there emerge the juſt quantity eclipſed.

Example, In the Eclipſe of the ☉ to happen in March, *Anno* 1652, the *Conjunctio apparens, ſeu viſa*, is the 29 day, at 9 houres, 47′, 33″, in the forenoon, the *ſemidiameter apparens*, of the ☉ then being 15′,12″, the *ſemidiameter apparens* of the ☾ 17′,1″, the aggregate of the ſemidiameters, 32′,13″, from which I deduct the *latitudo apparens*, of the ☾, and the Remainder is 30′,8″. the *Pars deficiens*, or the part of the ☉ Diameter darkned; Laſtly, I divide this *pars deficiens* 30′,8″, by the Diameter of the ☉ 30′,24″, and it giveth 59 deg. 28′,25″; which augmented by 12, maketh 11 Digits, 53′,41″: therefore this Eclipſe will be terrible and dreadfull to behold, yea, it will be totall in a manner, inſomuch that the bright day for a little while ſhall ſeem to be turned into a dreadfull night.

Chap. XXXV.

To finde the biginning and ending of the the Suns Eclipſe.

Because the Suns eclipſe is very ſeldom totall, proceed thus. Take the *latitudo apparens* of the Moon at the time of the viſible Synod, and that convert into ſeconds, which multiply in themſelves, and the Quadrat comming thereof, take out of the Quadrate made of the aggregate of the Semidiameters of the ☉ and the ☾, and the *Radix*, or Root of the number remayning is the *minuta incidentiæ, vel caſus*, which divide by the *motus horarius apparens* of the ☾ for one houre before the Eclipſe, and you ſhall have the meaſure or ſpace of time from the beginning of the Eccliſpe to the middle, called *Tempus incidentiæ*, and this ſpace of time being added to the middle of the Eclipſe, will give the end without ſenſible errour, but to finde the end more curiouſly, get the *motus horarius apparens*, of the ☾ for one houre after the Eclipſe, by which divide the minutes of Incidence, and you ſhall have the exact meaſure of time from the

middle of the Eclipse to the End, called in Latin, *Redditus luminis, & Tempus repletionis.*

EXMAPLE. At the time of the middle of the Eclipse before spoken of, I finde the aggregate of the semidiameters of the Sun and Moon to contein in seconds 1933, the Quadrate whereof is 3736489. Likewise the *Latitudo apparens* of the Moon being resolved into seconds is 125, the Quadrate whereof is 15625. Now I take the Quadrate of the Moons latitude out of the Quadrate of the sum of the semidiameters, and the remainder is 3720864. Whose *Radix* (according to the common operations of Arithmetink) is 1929. therefore the *minuta incidentiæ*, are 32′.9″. which divide by the *motus horarius apparens* for one hour preceding the middle of the eclipse 26′.4″. and the *Quotus* is the *Tempus Incidentiæ*, or the space from the beginning of the Eclipse to the middle thereof, *viz.* 1 houre, 14′.0″. which without sensible errour may serve, for the space between the middle and the end of the Eclips, but that you may have it more precise and accurate, take the *motus horarius apparens* of the Moon for one houre following the middle of the Eclipse 26′, 0″, by which divide the minutes of Incidence, and the Remainder is *Redditus Luminis*, or the time of the Repletion 1 houre, 14′.11″. and so long will it be from the middle of the Eclipse to the end thereof. This Ecclipse therefore will begin with us at *Stamford*, at 8 houres 33′.33″. and end at 11 houres, 1′.44″.

CHAP. XXXVI.

To finde the Latitudo apparens, *or apparent Latitude of the Moon at the beginning and ending of the Suns Eclipse.*

OUt of the true motion of the Moons latitude at the time of the apparent Synod, take the *minuta incidentiæ*, and the motion of the Sun agreeing to the time of incidence, and the Residue shall be the true motion of the Moons latitude at the beginning of the Eclipse, Contrariwise, to the true motion of the Moons latitude at the middle of the Eclipse, adde the *minuta incidentiæ*, and motion of the Sun agreeing to the time of incidence, and the Aggregate shal be the true motion of the Moons latitude at the end of the Eclipse, and thereby according to *Chap.7.* you shall finde her true latitude. Then calculate the *Parallaxis latitudinis* both at the beginning and ending of the Eclipse, which confer with the true latitude of the Moon,

Moon, according as you are directed by *Chap.* 33. preceding, and you ſhall have the *Latitudo apparens*, or latitude of the Moon ſeen both at the beginning and ending of the Eclipſe.

EXAMPLE. In the ſaid eclipſe, the true motion of the Moons latitude at the time of the viſible *Syzygia*, is 9 ſignes 8 deg. 42′,4″. out of which take the minutes of incidence and motion of the Sun anſwerable to the time of incidence 35′,11″. and there remains 9 ſig. 8 deg. 6′,53″. the motion of the Moons latitude at the beginning of the Eclipſe, but adding the ſame thereto, there ariſeth the motion of the Moons latitude at the end of the Eclipſe, 9 ſignes 9 deg. 17′,15″. and therefore her true latitude at the beginning is 42′,18″. and at the end 48′,20″. North. Alſo the *Parallaxis latitudinis*, of the Moon at the beginning of the Eclipſe is 51′,6″, and at the end 42′,32″, therefore the apparent latitude of the Moon at the beginning of the Eclipſe is 8′,48″ South, and at the end 5′,48″, North.

CHAP. XXXVII.

To foretell the colour of the Sun when he is eclipſed.

IT is a generall Rule confirmed by experience, that the neerer the ☉ is to the Dragons Head, or Tail, at the time of his Eclipſe, the ſadder and blacker is the colour, and the more diſtant, the brighter, therefore *Alphonſus* hath ſet down the ſubſequent Table, which you muſt enter with the diſtance of the ☉ from either of the Nodes, called the *Dragons Head*, and *Tail*, thus noted, ☊☋ and there you ſhall by inſpection only, finde the colour of the Eclips.

As in the Eclips of the Sun to be in March, *Anno* 1652, the diſtance of the Sun from the *Dragons Head* (thus noted ☊) is 8ᵈ 44′, which being found in the following Table, ſheweth that the ſaid Eclips will be of a *Grey ruddiſh colour*. The like is to be obſerved of any other. *A Table ſhewing the colour of the Suns Eclips.*

Diſtance of the ☉ from the ☊ or ☋.

Degr.	
1	Exceeding black.
2	Miſty black.
3	A brown black.
4	A brown mixed with yellow.
5	A lightſome brown.
6	A reddiſh brown.
7	Reddiſh and yellow.
8	Reddiſh and yellow.
9	A grey ruddiſh colour.
10	A ruſſet grey.
11	Yellow.
12	A white yellow.

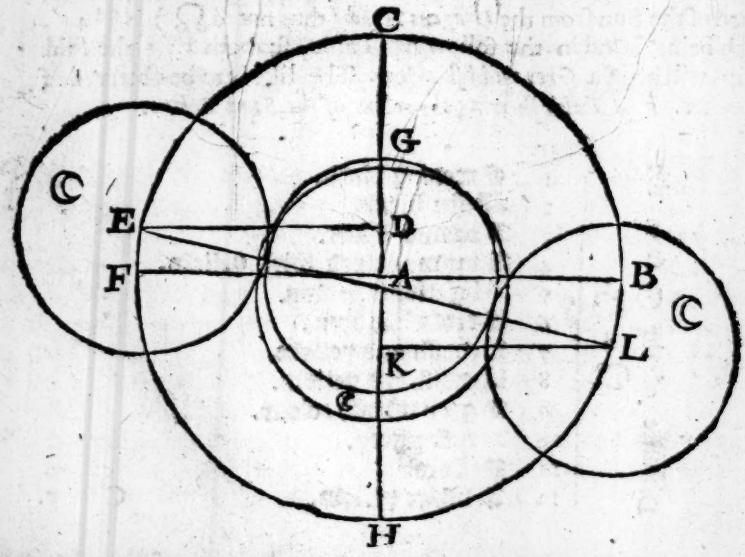
CHAP.

Chap. XXXVIII.

How to describe the Eclipse of the Sun in Plano.

THe deliniation of the Suns Eclips differs not sensibly from the Moons, onely, on the point A, the intersection of the two Orthogonall lines, draw a Circle, which may contein the Semidiamiters of the Sun and Moon, and then place the apparent Latitude at the beginning and ending, as you were taught before in the Moons Eclips.

Example, In the Eclips of the Sun to be in *March*, 1652, the semidiamiter of the Sun is 15′. 12″. the semidiameter of the Moon 17′. 1″. also, the apparent Latitude of the Moon at the beginning, is 8′. 48″. *South*, and at the end, 5′. 48″. *North*, therefore, (in the figure following) on the center A, describe a Circle representing the Sun, whose semidiameter A C shall contein 15′. 12″. then from the center A, in the line A H, number the apparent Latitude of the Moon in the beginning of the Eclipse, 8′, 48″; South, drawing forth the line K L, parallel to A B, and likewise from the Center A, upon the line A C. number her *latitudo apparens*, at the end of the Eclips 5′, 48″. North, drawing the line D E, parallel to A F, then extend a line from L to E, which signifies the way of the ☾ during the time of the Eclipse, upon which line describe three Moons, whereof the first upon the Center L shews the place of the ☾ at the beginning of the Eclipse, the second upon the Center A, shews her place at the middle of the Eclipse, and the third upon the center E, shews her place at the end of the Eclips, as by the following Diagram may appeare.



CHAP. XXXIX.

The Calculation of the ſaid Eclipſe of the Sun according to the preceding Directions.

	D	H	′	″
The mean ☌ of the Luminaries,	Mar. 29	00	43	21
The interval of the mean and true ☌	ſubſt.	03	00	19
The mean time of the true ☌	Mar. 28	21	45	02
The Æquation of time	adde		5	58
The apparent time of the true ☌	Mar. 28	21	51	00
The Anomalie of the ☉	1	10	39	40
The Anomalie of the ☾	7	12	32	54
The mean diſtance of ☾ *from the ☌ of* ☉	5	28	28	24
The true motion of the ☾ *latitude*	9	08	44	07
The Luminaries veer the Dragons head, *in*	♈	19	26	22
The Altitude of the Luminaries		37	47	55
The Parallax of the ☉			2	21
The Parallax of the ☾			49	37
The Parallax of the ☾ *from the* ☉			47	16
The parallacticall angle		88	10	33
Hence the Parallax of ☾ *from* ☉ *in Longitude is*			1	30
In Latitude			47	13
Now becauſe this Eclipticall ☌ hapneth in the Orientall Quadrant, therefore to 15′ of an houre, before the true ☌, viz, at		09	39	00
The altitude of the Luminaries will be		36	12	50
The parallax of the ☉			2	25
The parallax of the ☾			50	37
The parallax of the ☾ *from the* ☉			48	12
The parallacticall angle		86	07	46
From hence the Parallax of ☾ *from* ☉ *in longitude is*			3	15
And in latitude			48	06
The true motion of the ☾ *from the* ☉, *agreeing to 15′ of an houre, is*			8	16
The difference of the Parallaxis Longitudinis *in 15′*			1	45
The motion of the ☾ *from the* ☉ *ſeen, to 15′ of an houre*			6	31
Therefore the difference between the true and apparent ☌ ſubſtract.			3	27
So that the apparent time of the viſible ☌ will be	Mar. 28	21	47	33
At which time the altitude of the luminaries will be		37	26	43

The

		D	H	′	″
The Parallax of the ☉				2	22
The Parallax of the ☾				49	49
The Parallax of the ☾ *from the* ☉				47	27
The parallactical angle			87	40	27
Which give the Parallax of the ☾ *from* ☉ *in longitude*				1	55
And in latitude				47	25
The ☾ *Evection*				1	55

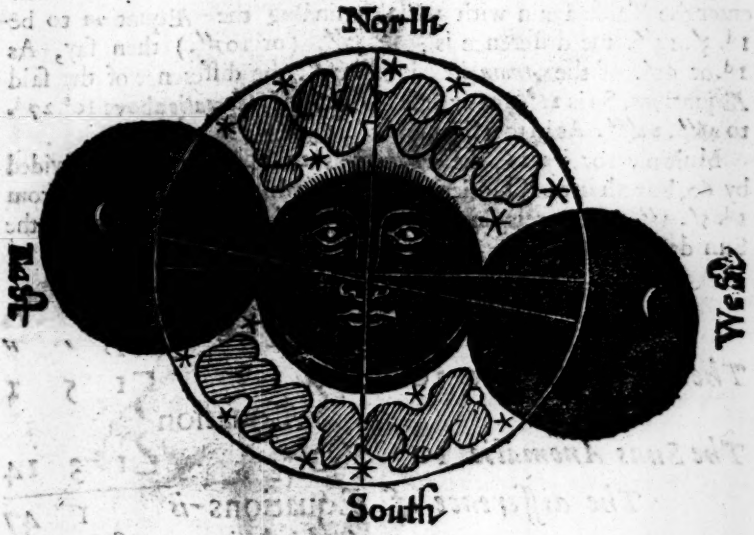
Which agreeing with the Parallax in Longitude, sheweth, the visible ☌ is truly found.

The apparent Semidiamiter	*Of the* ☉			15	12
	Of the ☾			17	1
The summe of the Semidiamiters				32	13
The apparent latitude of the ☾		South		2	05
The parts deficient				30	08
Therefore the Digits Eclipsed are	11 Dig 53′ 41″				
The minutes of incidence are				32	09
The time of incidence			01	14	00
The time of repletion			01	14	11
The totall duration			02	28	11
Latitude of the ☾ *seen at the*	*Beginning*	South		8	48
	End	North		5	48

			H	′	″
The	Beginning of the Eplips	*March* 29, *A.M.*	08	33	33
	Middle, or visible ☌		09	47	33
	End		11	01	44

A

A Type of the Suns Eclipse.



Anno 1652, March 29, *at* 9 *houres*, 47 *minutes*, and 33 *seconds*, the Sunne will be thus eclipsed.

Chap. XL.

To finde the part proportionall in the Table of the Sunnes Æquation.

FOR as much as the Æquation of the Sun in these our Tables (as in almost all other Tables) is calculated and set down onely to whole Degrees of the *Anomalie*, so that, oftentimes, the just number we desire is not to be found in the Tables, therefore, that wee may supply this defect, by the part proportionall, we have added the following operation, according to which all the rest may be formed.

It is required to finde the Æquation of the Sun, at the corrected time of the true Oppofition of the Sun and Moon, which is to happen the 15 of *May*, 1649, at $14^h. 12'. 12''$. the Suns *Anomalie* then being, $10^s. 27^d. 26'$. Wherefore, firſt enter the Table of the Suns Æquation with $10^s. 27^d.$ whoſe Æquation is $1^d. 5'. 1''$. Then enter the Table again with $10^s. 28^d.$ finding the Æquation to be $1^d. 3'. 14''$. the difference is, $1'. 47''$. (or $107''$.) then ſay, As $1^d.$ or $60'.$ of the *Anomalie*, is to $107''$. the difference of the ſaid Æquations, So is $26'.$ the exceſſe of the Suns *Anomalie* above $10^s. 27^d.$ to $46''. 22'''$. As in this Example.

Multiply 107 by 26, the Product is 2782, which being divided by 60, leaveth in the Quotient $46''. 22'''$. which being deducted from $1^d. 5'. 1''$. there remaineth, $1^d. 4'. 14''$. the Æquation of the Sun deſired.

The operation of the precedent Example.

	S	D		D	′	″
The Suns Anomalie	10	27	Æquation	1	5	1
The Suns Anomalie	10	28		1	3	14
The difference of Æquations is					1	47
(which is 107 *ſeconds.)*						

Then ſay,

If $1^d.$ *or* $60'.$ *give* $107''.$ *what ſhall* $26'.$ *give?*

$$\begin{array}{r} 26 \\ \hline 642 \\ 214 \\ \hline 60)\,2782\,(46\tfrac{22}{60} \\ 240 \\ 382 \\ 36 \\ \hline [22 \end{array}$$

CHAP.

Chap. XLI.

To finde the part proportionall in the Table of the Moons Æquation.

BEcauſe that in the Table of the Moons Æquation, we can ſeldome finde the juſt degree of the Moons *Anomalie*, nor of her diſtance from the Sun, it's therefore requiſite we ſhould ſhew how to finde the true Æquation correſpondent to her *Anomalie*, and her diſtance from the Sun, when we can finde neither of them, therefore for exerciſe ſake take this Example.

At the corrected time of the true Oppoſition of the Luminaries, before mentioned, to be 1649, *May* 15, $14^{h}.12'.12''$. The diſtance of the Moon from the Sun is, $5^{s}.28^{d}.44'.8''$. and the *Anomalie* of the Moon $6^{s}.26^{d}.20'.6''$. and in regard we can neither finde the juſt degree nor minute of the diſtance of the Moon from the Sun, nor of her *Anomalie*, therefore we work thus.

Firſt, enter the Table with $5^{s}.24^{d}$. (becauſe it is the next leſſer ſumme to the diſtance of the Moon from the Sun) and finding it at the bottome of the Table, proceed upward till you come againſt $6^{s}.24^{d}$. (the next leſſe ſumme to the Moons *Anomalie*) where you finde $2^{d}.3'$. which is the Æquation of the Moon agreeing to the ſaid motions: now in the columne of $5^{s}.24^{d}$. firſt take the proportionall part of the Moons *Anomalie*, finding the Æquation anſwerable to $5^{s}.24^{d}$. to be $2^{d}.3'$. and the Æquation anſwerable to $6^{s}.27^{d}$. to be $2^{d}.18'$. the difference of the ſaid Æquations is $15'$. which correſpond with 3^{d}. of the *Anomalie*: now ſay, If 3^{d}. (or $180'$) in the *Anomalie*, give $15'$, what ſhall $2^{d}.20'$ (or $140'$) give? Multiply the ſecond number by the third, that is, 140 by 15, the Product is, 2100, which being divided by 180, giveth in the quotient $11\frac{6}{9}$ that is, $11'.40''$. which adde to the Æquation before found $2^{d}.3'$. (in regard it augmenteth) and the Æquation corrected to the Moons *Anomalie* will be, $2^{d}.14'.40''$. Which done, take in the ſame line of the Moons *Anomalie* the difference of Æquations, between $5^{s}.24^{d}$. and $6^{s}.0^{d}$. to be $7'$. then becauſe the diſtance of the Moon from the Sun is $4^{d}.44'$. more then her leaſt diſtance found in the Table, which is, $5^{s}.24^{d}$.

Therefore, again say, if 6^d. (or $360'$.) give $7'$, what shall 4^g. $44'$. (or $284'$.) give? Multiply (as before) the second number by the third, and divide by the first, the Quotient is $5'.31''$. also to be added to the Æquation before found, $2^d.14'.40''$. (because the Æquation increaseth) and the coæquate Æquation of the Moon agreeing to her said *Anomalie* and elongation from the Sun, is $2^d.20'.11''$. which was the thing desired.

A Table of Æquation of Time, for the inequality of naturall dayes.

Degrees	♈ ♓		♉ ♍		♊ ♌		Degrees
	Adde		Adde		Adde		
	′	″	′	″	′	″	
0	0	00	8	25	8	47	30
1	0	20	8	36	8	37	29
2	0	40	8	45	8	26	28
3	0	59	8	55	8	15	27
4	1	19	9	4	8	3	26
5	1	39	9	12	7	50	25
6	1	59	9	19	7	36	24
7	2	18	9	26	7	22	23
8	2	38	9	32	7	7	22
9	2	57	9	37	6	52	21
10	3	16	9	42	6	36	20
11	3	35	9	46	6	20	19
12	3	57	9	50	6	3	18
13	4	12	9	52	5	46	17
14	4	30	9	54	5	28	16
15	4	47	9	56	5	10	15
16	5	5	9	56	4	51	14
17	5	22	9	56	4	32	13
18	5	38	9	55	4	12	12
19	5	55	9	53	3	53	11
20	6	11	9	51	3	33	10
21	6	26	9	48	3	12	9
22	6	41	9	44	2	51	8
23	6	56	9	40	2	31	7
24	7	10	9	34	2	9	6
25	7	24	9	28	1	48	5
26	7	37	9	21	1	27	4
27	7	50	9	14	1	5	3
28	8	2	9	6	0	43	2
29	8	14	8	57	0	22	1
30	8	25	8	47	0	00	0
	Substr.		Substr.		Substr.		
	♑ ♒		♎ ♏		♋ ♐		

A Table of the hourely motion of ☾ from ☉ in the New and Full ☾.

The Anomalie of ☾	Mean dist of ☾ frō ☉, or from his ☌ deg-0 ′ ″	deg-5 ′ ″	de-10 ′ ″	The Anomalie of ☾	The Anomalie of ☾	deg-0 ′ ″	deg-5 ′ ″	deg10 ′ ″	The Anomalie of ☾
Sign 0	27 15	27 15	27 15	Sign 12	Sign 6	34 18	34 18	34 17	Sign 6
5	27 16	27 16	27 17	25	5	34 16	34 16	34 15	25
10	27 17	27 1	27 20	20	10	34 13	34 12	34 11	20
15	27 20	27 22	27 24	15	15	34 8	34 7	34 5	15
20	27 24	27 26	27 28	10	20	34 0	33 58	33 56	10
25	27 29	27 32	27 34	5	25	33 51	33 49	33 47	5
Sign 1	27 35	27 38	27 41	Sign 11	Sign 7	33 39	33 36	33 34	Sign 5
5	27 43	27 46	27 49	25	5	33 27	33 24	33 22	25
10	27 53	27 56	27 59	20	10	33 12	33 9	33 6	20
15	28 2	28 6	28 9	15	15	32 57	32 54	32 51	15
20	28 12	28 16	28 19	10	20	32 39	32 36	32 33	10
25	28 24	28 28	28 31	5	25	32 23	32 19	32 16	5
Sign 2	28 37	28 41	28 44	Sign 10	Sign 8	32 4	32 0	31 56	Sign 4
5	28 50	28 54	28 58	25	5	31 46	31 42	51 38	25
10	29 6	29 10	29 14	20	10	31 27	31 23	31 19	20
15	29 21	29 25	29 29	15	15	31 9	31 5	31 1	15
20	29 38	29 43	29 48	10	20	30 47	30 43	30 39	10
25	29 54	29 59	30 4	5	25	30 31	30 27	30 23	5
Sign 3	30 12	30 17	30 23	Sign 9	Sign 9	30 12	30 8	30 4	Sign 3
5	30 31	30 36	30 42	25	5	29 54	29 50	29 46	25
10	30 47	30 52	30 58	20	10	29 38	29 34	29 30	20
15	31 9	31 14	31 20	15	15	29 21	29 17	29 13	15
20	31 27	31 32	31 38	10	20	29 6	29 2	28 58	10
25	31 46	31 51	31 57	5	25	28 50	28 47	28 43	5
Sign 4	32 4	32 9	32 15	Sign 8	Sign 10	28 37	28 34	28 30	Sign 2
5	32 23	32 28	32 33	25	5	28 24	28 21	28 18	25
10	32 39	32 43	32 48	20	10	28 12	28 10	28 7	20
15	32 57	32 1	32 6	15	15	28 2	28 0	27 58	15
20	33 12	33 16	33 20	10	20	27 53	27 51	27 49	10
25	33 27	33 31	33 35	5	25	27 43	27 42	27 40	5
Sign 5	33 39	33 42	33 45	Sign 7	Sign 11	27 35	27 34	27 33	Sign 1
5	33 51	33 54	33 56	25	5	27 29	27 28	27 27	25
10	34 0	34 2	34 4	20	10	27 24	27 23	27 22	20
15	34 8	34 10	34 11	15	15	27 20	27 19	27 19	15
20	34 13	34 14	34 15	10	20	27 17	27 17	27 17	10
25	34 16	34 17	34 17	5	25	27 16	27 16	27 16	5
Sign 6	34 18	34 18	34 17	Sign 6	Sign 12	27 15	27 15	27 15	Sign 0
	Sig-6	5 25	5 20			Sig 6	5 25	5 20	
	Mean dist of ☾ frō					☉, or from his ☌			

A Table shewing the Parallax of the Sun, in his *Almicanther*, or Circle of Altitude.

Altit. of ☉	Parallax of the ☉ ′	″	Altit. of ☉	Parallax of the ☉ ′	″	Altit. of ☉	Parallax of the ☉ ′	″
1	3	0	31	2	34	61	1	28
2	3	0	32	2	32	62	1	25
3	3	0	33	2	30	63	1	22
4	2	59	34	2	29	64	1	19
5	2	59	35	2	27	65	1	16
6	2	59	36	2	25	66	1	14
7	2	58	37	2	23	67	1	11
8	2	58	38	2	21	68	1	8
9	2	58	39	2	19	69	1	5
10	2	57	40	2	18	70	1	2
11	2	57	41	2	16	71	0	59
12	2	56	42	2	14	72	0	56
13	2	55	43	2	12	73	0	53
14	2	55	44	2	9	74	0	49
15	2	54	45	2	7	75	0	46
16	2	53	46	2	5	76	0	43
17	2	52	47	2	2	77	0	40
18	2	51	48	2	0	78	0	37
19	2	50	49	1	58	79	0	34
20	2	50	50	1	56	80	0	31
21	2	49	51	1	54	81	0	28
22	2	48	52	1	51	82	0	25
23	2	46	53	1	48	83	0	21
24	2	45	54	1	46	84	0	18
25	2	44	55	1	44	85	0	15
26	2	42	56	1	41	86	0	12
27	2	41	57	1	38	87	0	9
28	2	39	58	1	36	88	0	6
29	2	37	59	1	33	89	0	3
30	2	36	60	1	30	90	0	0

Place this Table, Fol. 118.

A Table shewing the Parallax of the Sun in the Almucantar, or Circle of Altitude.

A Table shewing the Parallax of ☾ in the Horizon, in the New & Full ☾

The Anomalie of ☾	Mean dist. of ☾ frō ☉, deg-0		deg-5		de-10		The Anomalie of ☾	The Anomalie of ☾	☉, or from hh ☿ deg-0		deg-5		deg-0		The Anomalie of ☾
	′	″	′	″	′	″			′	″	′	″	′	″	
Sign 0	59	9	59	9	59	9	Sign 12	Sign 6	62	39	62	39	62	39	Sign 6
5	59	9	59	9	59	9	25	5	62	38	62	38	62	38	25
10	59	10	59	10	59	10	20	10	62	37	62	37	62	36	20
15	59	11	59	12	59	12	15	15	62	34	62	34	62	33	15
20	59	13	59	13	59	14	10	20	62	30	62	30	62	29	10
25	59	15	59	6	59	17	5	25	62	26	62	25	62	24	5
Sign 1	59	18	59	20	59	21	Sign 11	Sign 7	62	21	62	20	62	18	Sign 5
5	59	22	59	24	59	25	25	1 5	62	14	62	14	62	11	25
10	59	27	59	28	59	29	20	10	62	7	62	6	62	4	20
15	59	32	59	33	59	34	15	15	61	59	61	58	61	56	15
20	59	37	59	39	59	40	10	20	61	51	61	50	61	48	10
25	59	43	59	45	59	47	5	25	61	42	61	41	61	38	5
Sign 2	59	50	59	52	59	54	Sign 10	Sign 8	61	33	61	31	61	28	Sign 4
5	59	57	59	59	60	1	25	5	61	24	61	22	61	19	25
10	60	5	60	7	60	9	20	10	61	15	61	13	61	10	20
15	60	12	60	14	60	16	15	15	61	5	61	3	61	0	15
20	60	20	60	22	60	24	10	20	60	56	60	54	60	51	10
25	60	29	60	31	60	33	5	25	60	47	60	45	60	42	5
Sign 3	60	38	60	40	60	42	Sign 9	Sign 9	60	38	60	36	60	33	Sign 3
5	60	47	60	49	60	51	25	15	60	29	60	27	60	24	25
10	60	56	60	58	61	0	20	10	60	20	60	18	60	15	20
15	61	5	61	7	61	9	15	15	60	12	60	10	60	7	15
20	61	15	61	17	61	19	10	20	60	5	60	3	60	0	10
25	61	24	61	27	61	29	5	25	59	57	59	55	59	52	5
Sign 4	61	33	61	36	61	38	Sign 8	Sign 10	59	50	59	48	59	45	Sign 2
5	61	42	61	45	61	47	25	5	59	43	59	41	59	38	25
10	61	51	61	53	61	54	20	10	59	37	59	35	59	33	20
15	61	59	62	1	62	2	15	15	59	32	59	30	59	28	15
20	62	7	62	9	62	10	10	20	59	27	59	26	59	24	10
25	62	14	62	16	62	17	5	25	59	23	59	22	59	20	5
Sign 5	62	21	62	22	62	23	Sign 7	Sign 11	59	19	59	18	59	17	Sign 1
5	62	26	62	27	62	28	25	5	59	15	59	14	59	13	25
10	62	30	62	31	62	32	20	10	59	13	59	12	59	11	20
15	62	34	62	34	62	35	15	15	59	11	59	11	59	10	15
20	62	37	62	37	62	37	10	20	59	10	59	10	59	10	10
25	62	38	62	38	62	38	5	25	59	9	59	9	59	9	5
	62	39	62	39	62	39			59	9	59	9	59	9	
	Sig-6		5	25	5	20			Sig-6		5	25	5	20	
	Mean dist. of ☾ frō								☉, or from his ☿.						

A Table shewing the apparent Semidiameter of the Sun, and the variation of the Earths shadow.

The Anomalie of the Sun.	The apparent semidiameter of ☉	The variation of the shado.
	′ ″	′ ″
Signe 0	15 0	0 0
5	15 0	0 0
10	15 0	0 0
15	15 1	0 1
20	15 1	0 1
25	15 2	0 2
Signe 1	15 2	0 2
5	15 3	0 3
10	15 4	0 4
15	15 5	0 5
20	15 6	0 6
25	15 6	0 7
Signe 2	15 7	0 8
5	15 8	0 10
10	15 9	0 11
15	15 11	0 12
20	15 12	0 14
25	15 13	0 15
Signe 3	15 15	0 17
5	15 16	0 18
10	15 17	0 19
15	15 18	0 20
20	15 20	0 22
25	15 21	0 23
Signe 4	15 22	0 24
5	15 23	0 25
10	15 24	0 25
15	15 25	0 26
20	15 26	0 27
25	15 26	0 27
Signe 5	15 27	0 27
5	15 28	0 27
10	15 28	0 28
15	15 29	0 28
20	15 29	0 28
25	15 29	0 28
Signe 6	15 30	0 28

The Anomalie of the Sun.
Signe 12
25
20
15
10
5
Signe 11
25
20
15
10
5
Signe 10
25
20
15
10
5
Signe 9
25
20
15
10
5
Signe 8
25
20
15
10
5
Signe 7
25
20
15
10
5
Signe 6

A Table shewing the apparent Semidiameter of ☾ in the new and full ☾

The Anomalie of ☾	Mean dist. of ☾ fro deg-0 ′ ″	deg-5 ′ ″	de-10 ′ ″	The Anomalie of ☾	The Anomalie of ☾	☉, or from his ☍ deg-0 ′ ″	deg-5 ′ ″	deg ′ ″	The Anomalie of ☾
Sign 0	15 15	15 15	15 15	Sign 12	Sign 6	17 20	17 20	17 20	Sign 6
5	15 15	15 15	15 15	25	5	17 19	17 19	17 19	25
10	15 16	15 16	15 16	20	10	17 18	17 18	17 18	20
15	15 17	15 18	15 18	15	15	17 16	17 16	17 16	15
20	15 19	15 20	15 20	10	20	17 14	17 14	17 13	10
25	15 21	15 22	15 23	5	25	17 12	17 11	17 10	5
Sign 1	15 24	15 25	15 26	Sign 11	Sign 7	17 9	17 8	17 7	Sign 5
5	15 27	15 28	15 29	25	5	17 6	17 5	17 4	25
10	15 31	15 32	15 33	20	10	17 2	17 1	17 0	20
15	15 35	15 36	15 37	15	15	16 58	16 57	16 56	15
20	15 39	15 40	15 41	10	20	16 54	16 53	16 52	10
25	15 43	15 44	15 46	5	25	16 50	16 49	16 47	5
Sign 2	15 47	15 48	15 50	Sign 10	Sign 8	16 46	16 45	16 43	Sign 4
5	15 52	15 53	15 55	25	5	16 42	16 41	16 39	25
10	15 57	15 58	16 0	20	10	16 37	16 36	16 34	20
15	16 2	16 3	16 5	15	15	16 32	16 31	16 29	15
20	16 7	16 8	16 10	10	20	16 27	16 26	16 24	10
25	16 12	16 13	16 15	5	25	16 22	16 21	16 19	5
Sign 3	16 17	16 18	16 20	Sign 9	Sign 9	16 17	16 16	16 14	Sign 3
5	16 22	16 23	16 25	25	5	16 12	16 11	16 9	25
10	16 27	16 28	16 30	20	10	16 7	16 6	16 4	20
15	16 32	16 33	16 35	15	15	16 2	16 1	15 59	15
20	16 37	16 38	16 39	10	20	15 57	15 56	15 54	10
25	16 42	16 43	16 44	5	25	15 52	15 51	15 50	5
Sign 4	16 46	16 47	16 48	Sign 8	Sign 10	15 47	15 46	15 45	Sign 2
5	16 50	16 51	16 52	25	5	15 43	15 42	15 41	25
10	16 54	16 55	16 56	20	10	15 39	15 38	15 37	20
15	16 58	16 59	17 0	5	15	15 35	15 34	15 33	15
20	17 2	17 3	17 4	10	20	15 32	15 31	15 30	10
25	17 6	17 6	17 7	5	25	15 28	15 27	15 26	5
Sign 5	17 9	17 9	17 10	Sign 7	Sign 11	15 24	15 23	15 22	Sign 1
5	17 12	17 12	17 13	25	5	15 21	15 20	15 19	25
10	17 14	17 14	17 15	20	10	15 19	15 18	15 18	20
15	17 16	17 16	17 17	15	15	15 17	15 17	15 17	15
20	17 18	17 18	17 18	10	20	15 16	15 16	15 16	10
25	17 19	17 19	17 19	5	25	15 15	15 15	15 15	5
Sign 6	17 20	17 20	17 20	Sign 6	Sign 12	15 15	15 15	15 15	Sign 6
	Sig-6 5	25	5 20			Sig-6 5	25	5 20	
	Mean dist. of ☾ fro					☉, or from his ☍			

A Table shewing the apparent Semidiameter of the shadow of the Earth, in the New and Full Moons.

The Anomalie of ☾	Mean dist. of ☾ fr☉ deg-0		deg-5		deg-10		The Anomalie of ☾	The Anomalie of ☾	☉, or from his ☍ deg-0		deg-5		deg-10		The Anomalie of ☾
	′	″	′	″	′	″			′	″	′	″	′	″	
Sign 0	43	0	43	0	43	0	Sign 12	Sign 6	47	0	47	0	46	59	Sign 6
5	43	1	43	1	43	1	25	5	46	59	46	59	46	58	25
10	43	2	43	2	43	2	20	10	46	57	46	56	46	55	20
15	43	3	43	3	43	4	15	15	46	53	46	52	46	51	15
20	43	6	43	6	43	7	10	20	46	48	46	47	46	46	10
25	43	10	43	10	43	11	5	25	46	43	46	41	46	39	5
Sign 1	43	14	43	15	43	16	Sign 11	Sign 7	46	36	46	34	46	32	Sign 5
5	43	18	43	19	43	20	25	5	46	28	46	26	46	24	25
10	43	23	43	23	43	24	20	10	46	20	46	18	46	16	20
15	43	29	43	30	43	30	15	15	46	12	46	10	46	8	15
20	43	36	43	37	43	38	10	20	46	4	46	1	45	58	10
25	43	42	43	44	43	45	5	25	45	54	45	51	45	48	5
Sign 2	43	49	43	51	43	53	Sign 10	Sign 8	45	44	45	41	45	38	Sign 4
5	43	56	43	58	44	0	25	5	45	33	45	30	45	27	25
10	44	5	44	7	44	9	20	10	45	23	45	20	45	17	20
15	44	14	44	16	44	18	15	15	45	13	45	10	45	7	15
20	44	23	44	26	44	28	10	20	45	3	45	0	44	57	10
25	44	33	44	36	44	39	5	25	44	53	44	50	44	47	5
Sign 3	44	43	44	46	44	49	Sign 9	Sign 9	44	43	44	40	44	37	Sign 3
5	44	53	44	56	44	59	25	5	44	33	44	30	44	27	25
10	45	3	45	6	45	9	20	10	44	23	44	20	44	17	20
15	45	13	45	16	45	19	15	15	44	14	44	11	44	9	15
20	45	23	45	26	45	29	10	20	44	5	44	2	44	0	10
25	45	33	45	36	45	39	5	25	43	58	43	54	43	52	5
Sign 4	45	44	45	47	45	50	Sign 8	Sign 10	43	49	43	47	43	45	Sign 2
5	45	54	45	57	46	0	25	5	43	42	43	40	43	38	25
10	46	4	46	6	46	9	20	10	43	36	43	34	43	32	20
15	46	12	46	14	46	17	15	15	43	29	43	28	43	26	15
20	46	20	46	22	46	25	10	20	43	23	43	22	43	20	10
25	46	28	46	30	46	32	5	25	43	18	43	17	43	15	5
Sign 5	46	36	46	38	46	40	Sign 7	Sign 11	43	14	43	13	43	11	Sign 1
5	46	43	46	44	46	46	25	5	43	10	43	9	43	8	25
10	46	48	46	49	46	51	20	10	43	6	43	6	43	5	20
15	46	53	46	54	46	55	15	15	43	3	43	3	43	3	15
20	46	57	46	58	46	58	10	20	43	2	43	2	43	2	10
25	46	59	46	59	46	59	5	25	43	1	43	1	43	1	5
Sign 6	47	0	47	0	47	0	Sign 6	Sign 12	43	0	43	0	43	0	Sign 0

Sig-6 5 25 5 20

Mean dist of ☾ fr☉

Sig-6 5 25 5 20

☉, or from his ☍.

A Canon or Table of converting houres and minutes of an houre, into minutes of the day.

H	D	H	D
1	0 02 30	31	1 17 30
2	0 05 00	32	1 20 00
3	0 07 30	33	1 22 30
4	0 10 00	34	1 25 00
5	0 12 30	35	1 27 30
6	0 15 00	36	1 30 00
7	0 17 30	37	1 32 30
8	0 20 00	38	1 35 00
9	0 22 30	39	1 37 30
10	0 25 00	40	1 40 00
11	0 27 30	41	1 42 30
12	0 30 00	42	1 45 00
13	0 32 30	43	1 47 30
14	0 35 00	44	1 50 00
15	0 37 30	45	1 52 30
16	0 40 00	46	1 55 00
17	0 42 30	47	1 57 30
18	0 45 00	48	2 00 00
19	0 47 30	49	2 02 30
20	0 50 00	50	2 05 00
21	0 52 30	51	2 07 30
22	0 55 00	52	2 10 00
23	0 57 30	53	2 12 30
24	1 00 00	54	2 15 00
25	1 02 30	55	2 17 30
26	1 05 00	56	2 20 00
27	1 07 30	57	2 22 30
28	1 10 00	58	2 25 00
29	1 12 30	59	2 27 30
30	1 15 00	60	2 30 00

A Canon, or Table of converting minutes of the day, into houres, and minutes of an houre.

H	D	H	D
1	0 24 0	31	12 24 0
2	0 48 0	32	12 48 0
3	1 12 0	33	13 12 0
4	1 36 0	34	13 36 0
5	2 00 0	35	14 00 0
6	2 24 0	36	14 24 0
7	2 48 0	37	14 48 0
8	3 12 0	38	15 12 0
9	3 36 0	39	15 36 0
10	4 00 0	40	16 00 0
11	4 24 0	41	16 24 0
12	4 48 0	42	16 48 0
13	5 12 0	43	17 12 0
14	5 36 0	44	17 36 0
15	6 00 0	45	18 00 0
16	6 24 0	46	18 24 0
17	6 48 0	47	18 48 0
18	7 12 0	48	19 12 0
19	7 36 0	49	19 36 0
20	8 00 0	50	20 00 0
21	8 24 0	51	20 24 0
22	8 48 0	52	20 48 0
23	9 12 0	53	21 12 0
24	9 36 0	54	21 36 0
25	10 00 0	55	22 00 0
26	10 24 0	56	22 24 0
27	10 48 0	57	22 48 0
28	11 12 0	58	23 12 0
29	11 36 0	59	23 36 0
30	12 00 0	60	24 00 0

An *Appendix* to the second *Part*.

Shewing how to find the rising, Southing, and setting of the Moone, according to her meane motion, vulgarly delivered by others, (though more succinctly.) Also to find the places of the Sunne and Moone Instrumentally; With other rules to finde the same exactly. Not heretofore published.

§. 1. *How to finde the Moons Age.*

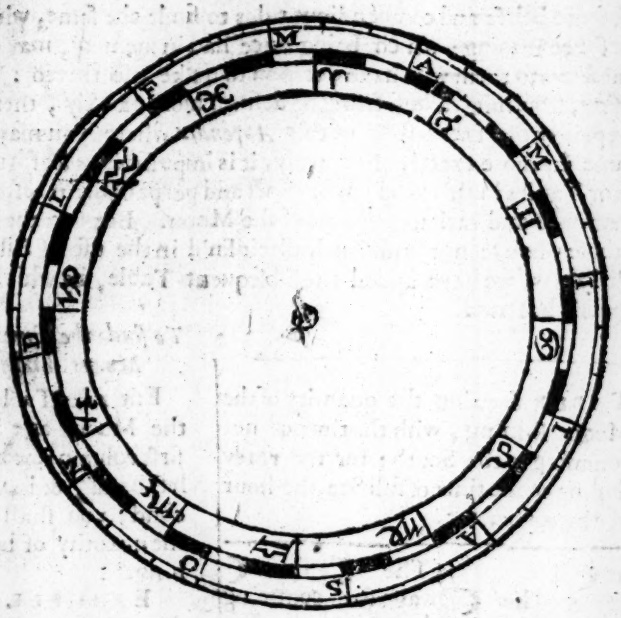
FIrst, you must finde, by the second Chapter of the second Part of this Booke, the day, houre, and minute of the Moones change. Now having found the day of the change, it is easie to finde her age, by counting how many dayes are included between the day of the change, and the day in which you seeke her age: for so many dayes old she is.

EXAMPLE. In the yeare 1649, *May* 7, I desire to know the Moons age, having found that the ☾ changeth on the first day, I count how many dayes are included between the first day and the seventh day (accounting the seventh day for one, and omitting the day on which shee changed, which you must alwaies doe, except the Moone change very early, as about 1. 2. 3. or 4. in the morning) which are six, wherefore I conclude, the Moone will be six daies old, on the 7 of *May*, 1649.

§. 2. *The use of an Instrument, by which may be known, the places of the Sun and Moon, according to their mean motions, exact enough for vulgar uses.*

THis instrument consisteth of 3 circles, severally divided, the two outermost are fixed, but the innermost is moveable; the outermost conteineth the days of the Yeare, the second the signes of the Zodiack, the third, the 30 daies of the Moons age; the use whereof is easie, for to finde the Moones place, having brought the index of the innermost Circle to the day of the Moneth, found in the outermost Circle, the Moones age in the inner circle will point directly to the signe in which the Moone is, counted in the middle Circle.

EXAM-



EXAMPLE. The 7 of *May* 1649 the Moone is 6 dayes old, and I desire to know her place on the same day, having brought the index of the Circle of the Moons age to the 7 day of *May*, (counted in the outermost circle) you shall finde 6, the Moons age (counted in the innermost Circle) to stand against the 13 degree of *Leo*, ♌ which is the Moones place on the 7 of *May*, 1649, according to her meane motion.

§. 3. *To finde the place of the Sun by the former Instrument.*

BRing the Index of the innermost Circle to the day of the Moneth (counted in the outermost Circle) and it will likewise cut the degree in which the ☉ is (being accounted in the middlemost Circle.)

EXAMPLE. I would know the Suns place on the 7 of *May*, 1649, bring the Index of the innermost circle to the day of the Moneth and it will lye upon the 27 degree of *Taurus*, ♉, which is his place on the seventh of *May*, 1649 according to his meane motion.

§. 4. *To know how long the Moon shineth, her comming to the South, and when shee riseth and setteth.*

BEcause we know many desire to have some Rules to finde how long the Moon shineth, and when she riseth and setteth, here are ad-

added some briefe and compendious rules to finde the same, with the time of her shining; which being once had in memory, may prove commodious to them who have occasion to make use thereof: Yet if her rising, Southing, and setting be desired more exactly, then may you repair to the two last § of this *Appendix* where you may finde the same far more exactly. For, truly, it is impossible to set forth any Rules or Tables in this kinde to be exact and perpetuall, in respect of the manifold and various motions of the Moon. But for the benefit of those who are not sufficiently disciplin'd in the use of Astronomicall Tables, we have added the subsequent Table, by which they may neerly be found.

A TABLE shewing the quantity of the Moons shining, with the time of her comming to the South: for the ready finding of the time of full Sea, the hour of the night, &c.

The ☾ age for her shining.		The ☾ shining.		§	The ☾ age for her Southing.		The ☾ comming to the South.	
Dayes.		*H*	*M*		*Dayes.*		*H*	*M*
1	29	12	48	§	1	16	0	48
2	28	1	36	§	2	17	1	36
3	27	2	24	§	3	18	2	24
4	26	3	12	§	4	19	3	12
5	25	4	00		5	20	4	00
6	24	4	48	§	6	21	4	48
7	23	5	36	§	7	22	5	36
8	22	6	24		8	23	6	24
9	21	7	12	§	9	24	7	12
10	20	8	00	§	10	25	8	00
11	19	8	48	§	11	26	8	48
12	18	9	36	§	12	27	9	36
13	17	10	24	§	13	28	10	24
14	16	11	12	§	14	29	11	12
15	15	12	00	§	15	30	12	00

To finde the time of the Moons shining.

Enter the Table with the Moons age in the first column toward the left hand, & in the second, you shall have the quantity of her shining.

EXAMPLE. On the 7 of *May*, 1649, the Moon is 6 dayes old, at which time I desire to know how long shee shineth: Finde 6 the Moons age in the first column of the Table, and against it, in the second column, you shall finde, 4 houres, 48 minutes, and so long doth the Moon shine.

To finde the time of the ☾ coming to the South.

Enter the Table with the Moones age in the third columne, and in the fourth you shall have the time at which the Moon commeth to the Meridian, or South point. Ex-

EXAMPLE. The Moon being 12 dayes old, I would know at what time ſhe will be full South: I find 12, the Moons age, in the third columne of the Table, and againſt it I finde 9 36, which is, 9 of the clock, and 36 minutes paſt, at which time, the Moon will be full South. Alſo, when the Moon is 25 dayes old, ſhee will be full South, at 8 of the clock; the like may be done for any time.

§. 5. *To finde the time of the Moons riſing and ſetting.*

TO finde her riſing. If the Moone increaſe, add the hou. and min. of her ſhining to the hou. and min. of the Suns riſing, and that ſhall give you the time of her riſing. But if the Moone decreaſe, (or be above 15 daies old) then you muſt take the quantitie of her ſhining from the time of ☉ riſing, and the remainder will be her riſing.

To finde her ſetting. The hou. and min. of the Moons ſhining (all the increaſe) being added to the time of Sun ſet, giveth her ſetting. But if the Moon decreaſe, you muſt ſubſtract her ſhining from the time of Sun ſetting, and the remainder is her ſetting; but if the time of Sun ſetting be leſſe then the time of her ſhining, then you muſt add 12 houres thereto, and the time will emerge.

§. 6. *To finde the houre of the Night by the ſhadow of the Moone on a Sun Diall.*

FIrſt, finde her comming to the South (as before) then repaire to a Sun-Diall, and marke how many houres and minutes the ſhadow wanteth of the line of 12, which houres and minutes, take from the houres and minutes of the Moones coming to the South, and the remainder is the houre of the Night. But if the ſhadow be paſt the line of 12. To have the houre of the Night, you muſt adde ſo many houres and minutes, as the ſhadow is paſt 12, to the houre and minute of the Moones comming to the South, and the time of the night will emerge.

EXAMPLE. The ſixth of *December* 1649 I finde the Moone is 13 dayes old, and therefore ſhee comes to the South at 10 a clock and 24 minutes after, and ſuppoſe you ſhould, the ſame night, looke upon a Sunne Diall, and finde the ſhadow to be halfe an houre paſt the line of 9 (that wants two houres and a halfe of the line of 12) which take from the Moones comming to the South) *viz.* 10 hour. 24 minutes, and 7 houres 54 minutes will be remaining, which is the time deſired.

Againe, ſuppoſe the ſame night the ſhadow of the Moone on the Diall had fallen upon the line of one, that is an houre paſt the line of 12, and therefore an houre paſt the Moons comming to the South, that is a 11 of the clock and 24 minutes at night, &c.

§. 7.

The use of the two following Tables, generally shewing the time of full-sea, or high-water at any time.

THe first of these Tables only sheweth the names of certain Ports or Havens in and about *England*, with the number of the point of the Compasse making full Sea, or high water in any of them: The other Table sheweth the time of high water in houres and minutes, at any of the places found in the following Table. Their use is thus.

Seeke the place where you would know the time of high water in the first of these Tables, and observe what figure standeth at the end of that line, where you finde the place you look for: then seek the age of the Moon, (which you may find in the first Section of this Appendix) which two numbers being known, repair to the other Table, and finde the age of the Moon in the first or second columne thereof, under the Title of *The Moons age*, and the other number among the great figures in the head of the Table, and in the common angle or meeting of these two lines, you shall have the time of high water in houres and minutes.

EXAMPLE. I would know the time of high water at *London* Bridge on the seventh day of *May* in the yeare 1649: I finde the Moon on that day to be six daies old, and the figure standing against *London* in the first of these Tables is 5. Now finding 6, the Moons age, in the first columne of this Table, and 5, the number standing against *London* in the head thereof, I guide my eye downe from 5 in the head of the Table, till I come against 6, the Moons age, and there I find, 7 48, which is 7 houres & 48 minutes, or 7 of the clock, & 48 minutes past, at which time it wil be high water at *London* on the 7 of *May* 1649. In like manner, the same day at *Gravesend* it will be high water 18 minutes after 6 of the clock. And in this manner you may finde the time of high water in any of the places mentioned in the first Table.

But you are to note that the Tides do not always fall out exactly at the time found in this Table, by reason of the difference of the Moons Latitude, boysterous winds, land flouds, &c. which may cause them somtimes to erre from the time here found, but this is the exactest rule that can generally be given for the finding of them.

A

A TABLE shewing the names of certain Havens, in and about ENGLAND: with the number of the Point of the Compasse that (unto which when the Moon commeth) maketh Full-Sea, or High-Water.

Queenborough, Southampton, Portsmouth Isle of Wight, Spits, Kentish knock.	1
Rochester, Maldon, Aberden, Redband, West end of the Nowze.	2
Gravelend, Downs, Rumney, Tenet, Silly-halfe tide, Blacknesse.	3
Dundee St. Andrews, Lisbone, St. Lucas, Bell Isle, Holy-Isle.	4
London, Tinmouth, Hartlepool, White-bay, Amsterdam, Brittain, Galizia.	5
Barwick, Flamborough head, Bridlington Bay, Burdeaux.	6
Scarborough Quarter tide, Lawrenas, Severn, Rotz-haven, Dungarum,	7
New-castle, Humber, Falmouth, Sally, Dartmouth, Torbay, St. Mallows.	8
Plimmouth, Weymouth, Hull, Lyn, Davids head, Antwerp.	9
Brisstoll, Foulnesse, at the Start.	10
Milford, Bridgewater, Land's-end, Waterford, Abermorick.	11
Portland, Peterport, Harflew, the Hague, St. Magnes sound, Dublin, Lambay.	12
Pool, St. Hellen, Catnes, Orkney, Faire-Isles, Kilbiern.	13
Needles, Laysto, North and South fore lands.	14
Yarmouth, Dover, Harwich, St. John, de Luce, Calice Roade.	15
Rye, Winchelsey, Gorend, Thames, Rhodes.	16

A

A Table shewing the time of high-water in houres and minutes, in any of the places mentioned in the former Table.

The moons age.		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
		H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
1	16	12	48	1	33	2	18	3	3	3	48	4	33	5	18	6	3	6	48	7	33	8	18	9	3	9	48	10	33	11	18	12	3
2	17	1	36	2	21	3	6	3	51	4	36	5	21	6	6	6	51	7	36	8	21	9	6	9	51	10	36	11	21	12	6	12	51
3	18	2	24	3	9	3	54	4	39	5	24	6	9	6	54	7	39	8	24	9	9	9	54	10	39	11	24	12	9	12	54	1	39
4	19	3	12	3	57	4	42	5	27	6	12	6	57	7	42	8	27	9	12	9	57	10	42	11	27	12	12	12	57	1	42	2	27
5	20	4	00	4	45	5	30	6	15	7	00	7	45	8	30	9	15	10	00	10	45	11	30	12	15	1	00	1	45	2	30	3	15
6	21	4	48	5	33	6	18	7	3	7	48	8	33	9	18	10	3	10	48	11	33	12	18	1	53	1	48	2	33	3	18	4	3
7	22	5	36	6	21	7	6	7	51	8	36	9	21	10	6	10	51	11	36	12	21	1	6	1	51	2	36	3	21	4	6	4	51
8	23	6	24	7	9	7	54	8	39	9	24	10	9	10	54	11	39	12	24	1	9	1	54	2	39	3	24	4	9	4	54	5	39
9	24	7	12	7	57	8	42	9	27	10	12	10	57	11	42	12	27	1	12	1	57	2	42	3	27	4	12	4	57	5	42	6	27
10	25	8	00	8	45	9	30	10	15	11	00	11	45	12	30	1	15	2	00	2	45	3	30	4	15	5	00	5	45	6	30	7	15
11	26	8	48	9	33	10	18	11	3	11	48	12	33	1	18	2	3	2	48	3	33	4	18	5	3	5	48	6	33	7	18	8	3
12	27	9	36	10	21	11	6	11	51	12	36	1	21	2	6	2	51	3	36	4	21	5	6	5	51	6	36	7	21	8	6	8	51
13	28	10	24	11	9	11	54	12	39	1	24	2	9	2	54	3	39	4	24	5	9	5	54	6	39	7	24	8	9	8	54	9	39
14	29	11	12	11	57	12	42	1	27	2	12	2	57	3	42	4	27	5	12	5	57	6	42	7	27	8	12	8	57	9	42	10	27
15	30	12	00	12	45	1	30	2	15	3	00	3	45	4	30	5	15	6	00	6	45	7	30	8	15	9	00	9	45	10	30	11	15

§. 8. *To finde the exact moment of the Moones comming to the South.*

BUt becauſe the fore-going Rules are not, at all times, preciſe in reſpect of the manifold motions of the Moone, but principally in reſpect of her latitude; it will not here bee amiſſe to ſhew how to Calculate the true time of her Riſing, Southing, and Setting, at all times, *Ex Tabulis Directionum Regiomontani*; but in caſe this be too obſcure add intricate (for the vulgar) let them uſe the former, which are very eaſie, though not at all times congruent to the *Phænomenie.*

Subſtract the right aſcenſion of the Sun, from the right aſcenſion of the Moone, (*viz.* at the æſtimate time of her Culmination) and the remainder (being converted into time) will ſhew the accurate moment of the Moones comming to the South point.

EXAMPLE. It is required to finde the true houre and minute of the Moones comming to the South point, the 9 of *December* this preſent yeare 1648, the æſtimate time whereof, according to the foregoing Rules (uſually called the Common Rules) is at 4 houres 0 minutes, at which time (according to our Tables) the Sun is in $28^d.\ 33'.\ 2''.\ ♐$, and the Moone in $2^d.\ 19'.\ 0''.\ ♓$, with latitude $5^d.\ 6'.$ South, the Suns right aſcenſion is therefore $268^d.\ 25'$ and the Moons $336^d.\ 11'.$ from which I deduct the Sunnes right aſcenſion, and there remaines $67^d.\ 46'.$ and this converted into time, giveth $4^h.\ 31'.$ Therefore I conclude, the Moone is due South, the ſaid 9 of *December*, 31′ paſt 4 a cloſcke in the afternoone.

PRAXIS.	d	′
Right aſcenſion of the Moon	336.	11.
Right aſcenſion of the Sunne	268.	25.
Dif.	67.	46.
Which converted into time, *facit* Ho:	4.	31′.

§. 9. *To find the juſt houre and minute of the Moones riſing and ſetting.*

FIrſt, to finde the time of the Moones riſing, you muſt calculate the obliqne aſcenſion of the Sun, with the time of his riſing, according to the latitude of the place; next, you muſt compute the obque aſcenſion of the Moone, from which you are to deduct the Suns blique aſcenſion, and the arch remaining, being turned into time, & dded to the houre and min. of the Suns riſing, will give the time of e Moones riſing, if her Parallax and Refraction be alſo duely conſidered.

EXAMPLE. The 20 of December this present yeare 1648, I desire to know the time of the rising of the Moone, which I guesse will be about 4 in the afternoon. The place of the Sun (according to our Tables) is then $9^d. 47'. 37''.$ ♑, and his oblique Ascension $314^d. 45'.$ also the place of the Moon is $18^d. 56'. 25''.$ ♋, with North latitude $2^d. 50'. 23''.$ and therefore his oblique Ascension is $72^d. 18'.$ to which adding the whole Circle $360^d.$ and from the summe thereof deducting the Sunnes oblique Ascension, there will remaine $117^d. 33'$ which converted into time, maketh $7^h. 50'$, to be added to the time of the Sunnes rising $8^h. 16'. 20''.$ and there commeth $16^h. 6'. 20''.$ But because her Parallax exceeds her Refraction $2'.$ I therefore add $2'.$ thereunto, and the Product is $16^h. 6'. 20''.$ from which casting $12^h.$ there remaines $4^h. 8'. 20''.$ the time of the Moones rising afternoone the said 20 of *December* 1648.

PRAXIS.

Place of the ☉	$9^d. 47'. 37''.$ ♑	*Place of the* ☾	$18^d. 16'. 25''.$ ♋
Declinat. ☉	$23^d. 8'.$ *North.*	*Latitude* ☾	$2^d. 50'. 23''.$ *North.*
Right Ascension of ☉	$280^d. 40'$	*Declination* ☾	$25^d. 6'.$ *North.*
Ascensionall Difference	$34^d. 5'$	*Right Ascension of* ☾	$110^d. 13'.$
Oblique Ascension of ☉	$314^d. 45'.$	*Ascensionall Difference*	$37^d. 55'.$
Sun rising at Ho:	8. 16'. 20''.	*Oblique Ascension of* ☾	$72^d. 18'.$

The whole Circle		$360^d. 0'$
The Oblique Ascens. of the ☾		$72^d. 18'$
	Aggr.	$432^d. 18'.$
☉ Oblique Ascens. to be Substr.		$314^d. 45'.$
	Residue	$117^d. 33'.$
Residue, which converted into time, giveth,	*Ho:*	$7\ 50'. 0''.$
Suns rising to be added		$8\ 16'. 20''.$
	Aggr.	$16\ 6'. 20''.$
For her Parallax adde		$2'. 0''.$
Time of ☾ rising after midn.		$16\ 8'. 20''.$
		$12\ 0'. 0''.$
True time of ☾ rising aftern.	*ho:*	$4\ 8'. 20''.$

Partly after the same manner may you find her setting, for (at the estimate time of her setting) you are to finde the Oblique Descension of the Sun, with the houre and minute of his setting, at which time you are also to acquire the Oblique Descension of the Moone, which had, subduct the Oblique Descension of the Sun, from the Oblique Descension of the Moon, and the Remainder being converted into

into houres, and added to the setting of the Sun, will give the houre of the setting of the Moon. But left this thing (which is so usefull) should seem intricate and ambiguous, wee will annex the Example and operation (as before) for the better illustration thereof.

EXAMPLE. The 21 of *December*, being the day following, I would know the houre and minute of the Moons setting, which I suppose will be about halfan houre past 9 in the morning, at which time the Sun is in 10 d. 32′. 21″. ♑, and the Moon in 27 d. 43′. 21″ ♋, with North latitude 3 d. 30′. 1″, therefore the Suns oblique Descension is 247 d. 28′, and the Moons oblique Descension 156 d. 33′, from which, because we cannot substract the Suns obliqne Descension, we add the whole circle 360 d. and from the Product thereof we deduct the Suns oblique Descension, and there remains 247 d. 28′. which in time is 17 h. 56′, to which adding the time of Sun-setting, 3 h. 44′, it produceth 21 h. 40′, that is, at 9 a clock, and 40′ in the morning, from which deducting 2′, for her Parallax, there remains 9 h. 38′, the exact time of the Moons setting the said 21 of *December* in the morning.

PRAXIS.

Place of ⊙ 10 d. 32′. 21″. ♑
Declination of ⊙ 23 d. 5′. South
Right Ascension of ⊙ 281 d. 28′
Ascensionall difference 34 d. 0′.
Oblique Descensiō of ⊙ 247 d. 28′
⊙ *sets at* 3 h. 44′. 00″.

Place of ☾ 27 l. 43′. 21″. ♋
Latitude of ☾ 3 d. 13′. 30″, Nor.
Declination of ☾ 24 d. 7′. North
Right Ascension of ☾ 120 l. 35′.
Ascensionall differenc 35 l. 58′.
Oblique Descension of ☾ 156 d. 33′.

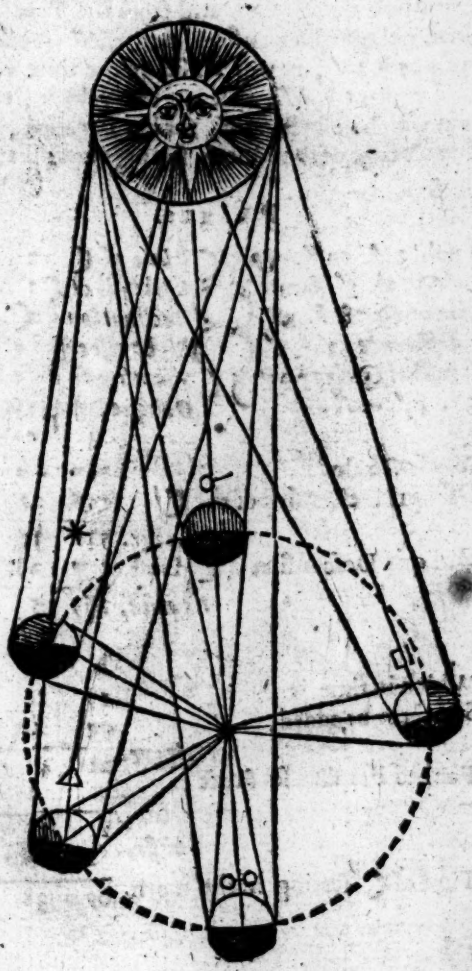
	d	′
Whole Circle	360	00
Oblique Descension of the ☾	156	33
Aggr.	516	33
Oblique Descension of ☾ subst.	247	28
Remain.	269	5

	h	′	″
Which in time is	17	56	20
Sun set to be added,	03	44	00
Aggre.	21	40	20
For her Parallax substract		2	0
Substr	21	38	20
	12	00	00
Time of ☾ setting in the morn.	09	38	20

The

The diligent *Astrophile*, according to the *prescript* method, may compute the Rising, Southing, and Setting of the other Planets, and fixed Stars, at all times, having their true places given, both in Longitude and Latitude, which the *Ephemerides* of *Eichstade* exactly sheweth, notwithstanding, we refer the Student to the *Ephemerides* of *Argoll*, wherein he shall not onely finde their true places, but also the Tables of Directions above mentioned, by which the precedent operations are all formed.

A Scheme of the Moons illumination.



The

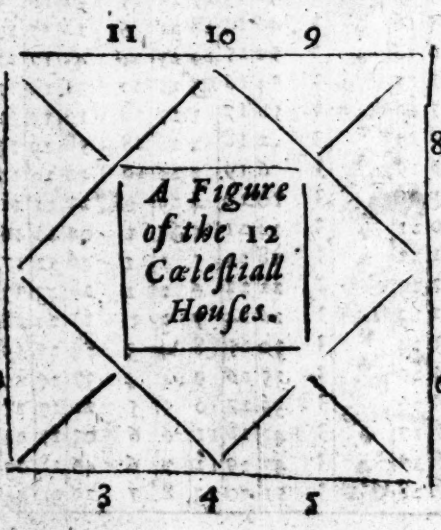
The third Part:

In which is contained divers excellent Rules and Tables Astrologicall, *to erect a Figure of the 12 Houses: to judge of the effects of Eclipses: and to calculate the time when the effects thereof begin to operate, with divers other* Astrologicall *Rules and Observations appertaining to Eclipses.*

Chap. I.

The opinion of the Ancients concerning the describing of the Face of Heaven in plano, *with the forme of a figure, according to the generall receiv'd opinion.*

A Cœlestiall Figure (which sheweth the face of the Heavens to our view in *plano*) was wont to be erected diversly of Astronomers: Some beginning at the *Ascendant*, divide the *Zodiack* into 12 equall parts, by Circles meeting in the Poles of the *Zodiack*: Others divide the *Æquinoctiall* into 12 equall parts, by imaginary Circles drawn from the Poles of the World: Othersome divide the Verticall circle of the East into 12 parts: But that is held to be the most rationall, which divides the *Æquinoctiall* into 12 equall parts by circles, meeting at the intersections of the *Meridian* and *Horizon*. But for the order of the houses all agree, beginning the 1 house at the East, calling it the *Ascendant* and *Horoscope*, & so proceed under the Earth, and the rest in their order, by the *imum Cœli* unto the *Descendant*, and thence by the *medium Cœli* to the *Ascendant* again. As in this figure.



A TABLE of Houſes, for the Latitude of 52 degrees.

☉ in ♈

Time from noon.	10	11	12	Aſcen.		2	3
	♈	♉	♊	♋		♌	♍
h m	D	D	D	d	m	D	D
0 0	0	13	7	27	02	16	5
0 4	1	14	18	27	42	17	5
0 7	2	15	19	28	22	17	6
0 11	3	17	20	29	02	18	7
0 15	4	18	21	29	41	19	8
0 18	5	19	22	♌	21	19	8
0 22	6	20	22	1	00	20	9
0 26	7	21	23	1	40	21	10
0 29	8	22	24	2	19	21	11
0 33	9	2	25	2	59	22	12
0 37	10	24	26	3	38	23	12
0 40	11	26	27	4	17	23	13
0 44	12	27	28	4	56	24	14
0 48	13	28	28	5	36	25	15
0 52	14	29	29	6	15	25	16
0 55	15	♎	♋	6	54	26	16
0 59	16	1	1	7	33	27	17
1 3	17	2	2	8	21	27	18
1 6	18	3	3	9	00	28	19
1 10	19	4	4	9	38	29	19
1 14	20	5	4	10	15	♍	20
1 18	21	6	5	10	52	0	21
1 21	22	7	6	11	30	1	22
1 25	23	8	7	12	09	2	23
1 29	24	9	8	12	48	2	23
1 33	25	10	9	13	27	3	24
1 36	26	11	9	14	07	4	25
1 40	27	12	10	14	46	4	26
1 44	28	13	11	15	26	5	27
1 48	29	14	12	16	05	5	27
1 52	30	15	13	16	45	6	28

☉ in ♉

Time from noon.	10	11	12	Aſcen.		2	3
	♉	♊	♋	♌		♍	♎
h m	D	D	D	d	m	D	D
1 52	0	15	13	16	45	6	28
1 56	1	16	14	17	25	7	29
1 59	2	17	14	18	05	8	♎
2 03	3	18	15	18	45	8	1
2 07	4	19	16	19	25	9	1
2 11	5	20	17	20	05	10	2
2 15	6	21	18	20	45	11	3
2 19	7	22	19	21	26	11	4
2 23	8	23	19	22	06	12	5
2 26	9	24	20	22	47	13	5
2 30	10	25	21	23	28	14	6
2 34	11	25	22	24	09	14	7
2 38	12	26	23	24	50	15	8
2 42	13	27	23	25	31	16	9
2 46	14	28	24	26	12	17	10
2 50	15	29	25	26	43	17	11
2 54	16	♋	26	27	35	18	11
2 58	17	1	27	28	16	19	12
3 2	18	2	28	28	58	19	13
3 6	19	3	28	29	40	20	14
3 10	20	4	29	♍	22	21	15
3 14	21	4	♌	1	04	22	16
3 18	22	5	1	1	46	22	17
3 22	23	6	2	2	28	23	17
3 26	24	7	3	3	11	24	18
3 30	25	8	4	3	54	25	19
3 35	26	9	4	4	37	26	20
3 39	27	10	5	5	20	27	21
3 43	28	11	6	6	03	27	22
3 47	29	12	7	6	46	28	23
3 51	30	13	8	7	29	29	24

A TABLE of Houſes, for the Latitude of 52 degrees.

☉ in ♈								☉ in ♉							
Time from noon.	10 ♈	11 ♉	12 ♊	Aſcen. ♍		2 ♍	3 ♎	Time from noon.	10 ♉	11 ♊	12 ♍	Aſcen. ♍		2 ♎	3 ♏
h m	D	D	D	d	m	D	D	h m	D	D	D	d	m	D	D
3 51	0	13	8	07	29	29	24	6 00	0	10	5	00	00	22	20
3 55	1	14	9	08	13	29	24	6 04	1	11	6	00	46	23	21
4 00	2	14	10	08	57	♎	25	6 09	2	11	6	01	32	23	22
4 04	3	15	10	09	41	1	26	6 13	3	12	7	02	18	24	23
4 08	4	16	11	10	25	2	27	6 17	4	13	8	03	04	25	24
4 12	5	17	12	11	09	2	28	6 22	5	14	9	03	49	26	25
4 16	6	18	13	11	53	3	29	6 26	6	15	10	04	35	27	26
4 21	7	19	14	12	37	4	♏	6 30	7	16	11	05	21	28	27
4 25	8	20	15	13	22	5	1	6 35	8	17	12	06	07	28	28
4 29	9	21	16	14	06	6	2	6 39	9	18	13	06	54	29	29
4 33	10	22	17	14	51	6	2	6 44	10	19	14	07	39	♏	29
4 38	11	23	17	15	35	7	3	6 48	11	20	15	08	24	1	♐
4 42	12	23	18	16	20	8	4	6 52	12	20	16	09	09	2	1
4 46	13	24	19	17	05	9	5	6 56	13	21	17	09	55	2	2
4 51	14	25	20	17	50	9	6	7 00	14	22	17	10	40	3	3
4 55	15	26	21	18	35	10	6	7 05	15	23	18	11	35	4	4
4 59	16	27	22	19	21	11	7	7 09	16	24	19	12	10	5	5
5 03	17	27	23	20	06	12	8	7 14	17	25	20	12	55	5	6
5 08	18	28	24	20	51	12	9	7 18	18	26	21	13	40	6	7
5 12	19	29	25	21	37	13	9	7 22	19	27	22	14	25	7	7
5 16	20	♋	26	22	22	14	10	7 27	20	28	23	15	09	8	8
5 21	21	1	26	23	08	15	11	7 31	21	29	24	15	54	9	9
5 25	22	2	27	23	53	16	12	7 35	22	29	25	16	38	9	10
5 30	23	3	28	24	39	16	12	7 39	23	♍	26	17	23	10	11
5 34	24	4	29	25	25	17	13	7 44	24	1	27	18	07	11	12
5 38	25	5	♍	26	10	18	14	7 48	25	2	27	18	52	12	13
5 43	26	6	1	26	56	19	15	7 52	26	3	28	19	36	12	14
5 47	27	7	2	27	42	20	16	7 56	27	4	29	20	20	13	15
5 51	28	8	3	28	28	20	17	8 00	28	5	♎	21	04	14	16
5 56	29	9	4	29	14	21	18	8 05	29	6	1	21	48	15	16
6 00	30	10	5	30	00	22	19	8 09	30	6	2	22	31	15	17

A Table of Houſes, for the Latitude of 52 degrees.

☉ in ♌									☉ in ♍								
Time from noon.	10 ♌ ♍	11 ♍ ♎	12 ♎ ♎	Aſcend. ♎		2 ♍	3 ♐		Time from noone.	10 ♍ ♎	11 ♎ ♎	12 ♎ ♎	Aſcend. ♍		2 ♐	3 ♑
h	m	D	D	D	d	m	D	D	h	m	D	D	D	d	m	D	D
08	09	00	06	02	22	31	15	17	10	08	00	02	27	13	15	08	15
08	13	01	07	03	23	14	16	18	10	12	01	03	28	13	54	08	16
08	17	02	08	04	23	57	17	19	10	16	02	04	29	14	34	09	17
08	21	03	09	05	24	40	18	20	10	20	03	04	♍	15	13	10	18
08	25	04	10	05	25	23	18	21	10	24	04	05	00	15	53	11	19
08	30	05	11	06	26	06	19	22	10	27	05	06	01	16	33	11	20
08	34	06	12	07	26	49	20	23	10	31	06	07	02	17	12	12	21
08	38	07	13	08	27	31	21	24	10	35	07	07	03	17	52	13	22
08	42	08	13	09	28	14	22	25	10	39	08	08	03	18	32	14	23
08	46	09	14	10	28	56	22	26	10	42	09	09	04	19	11	14	24
08	50	10	15	11	29	38	23	26	10	46	10	10	05	19	51	15	25
08	54	11	16	12	0om	20	24	27	10	50	11	11	06	20	30	16	26
08	58	12	17	12	01	02	25	28	10	54	12	12	07	21	09	17	27
09	02	13	18	13	01	44	25	29	10	57	13	12	07	21	48	17	28
09	06	14	18	14	02	26	26	♑	11	01	14	13	08	22	27	18	29
09	10	15	19	15	03	08	27	01	11	05	15	14	09	23	06	19	♒
09	14	16	20	16	03	49	28	02	11	08	16	15	10	23	45	20	01
09	18	17	21	17	04	30	28	03	11	12	17	15	10	24	25	21	02
09	22	18	22	17	05	11	29	04	11	16	18	16	11	25	04	21	03
09	26	19	23	18	05	52	♐	05	11	20	19	17	12	25	43	22	04
09	30	20	24	19	06	33	01	06	11	23	20	18	13	26	22	23	06
09	34	21	25	20	07	14	01	07	11	27	21	18	14	27	02	24	07
09	38	22	25	21	07	55	02	07	11	31	22	19	14	27	41	24	08
09	41	23	26	22	08	36	03	08	11	34	23	20	15	28	21	25	09
09	45	24	27	22	09	17	03	09	11	38	24	21	16	29	00	26	10
09	49	25	28	23	09	57	04	10	11	42	25	22	17	29	40	27	11
09	53	26	29	24	10	37	05	11	11	45	26	22	17	00	♐ 20	28	12
09	57	27	29	25	11	16	06	12	11	49	27	23	18	00	59	29	13
10	01	28	♎	26	11	56	06	13	11	53	28	24	19	01	39	♑	15
10	05	29	01	26	12	35	07	14	11	56	29	25	20	02	18	01	16
10	08	30	02	27	13	15	08	15	12	00	30	26	20	02	58	01	17

A TABLE of Houſes, for the Latitude of 52 degrees.

⊙ in ♎

Time from noon.		10	11	12	Aſcen.		2	3
		♎	♎	♍	♐		♑	♒
h	m	D	D	D	d	m	D	D
12	00	0	26	20	02	58	01	17
12	06	1	26	21	03	38	02	18
12	11	2	27	22	04	18	03	19
12	15	3	28	23	04	59	04	21
12	18	4	29	23	05	39	04	22
12	22	5	29	24	06	20	05	23
12	26	6	♍	25	07	01	06	24
12	29	7	01	26	07	42	07	26
12	33	8	02	26	08	23	08	27
12	37	9	03	27	09	05	09	28
12	40	10	03	28	09	46	10	29
12	44	11	04	29	10	28	11	♓
12	48	12	05	♐	11	10	12	02
12	52	13	06	00	11	53	13	03
12	55	14	06	01	12	35	14	05
12	56	15	07	02	13	18	15	06
12	59	16	08	03	14	01	16	07
13	03	17	08	04	14	44	17	09
13	06	18	09	04	15	28	18	10
13	10	19	10	05	16	12	19	11
13	14	20	11	06	16	56	20	13
13	18	21	12	06	17	41	21	14
13	21	22	12	07	18	26	22	16
13	25	23	13	08	19	12	24	17
13	29	24	17	09	19	58	25	18
13	33	25	15	10	20	44	26	20
13	36	26	15	10	21	31	27	21
13	40	27	16	11	22	19	28	22
13	44	28	17	12	23	07	♒	24
13	48	29	18	13	23	56	01	25
13	52	30	19	14	24	45	02	27

⊙ in ♍

Time from noon.		10	11	12	Aſcen.		2	3
		♍	♍	♐	♐		♏	♓
h	m	D	D	D	d	m	D	D
13	52	00	19	14	24	45	02	27
13	55	01	19	14	25	34	03	28
13	59	02	20	15	26	24	05	♈
14	03	03	21	16	27	15	06	01
14	07	04	22	17	28	06	07	03
14	11	05	23	18	28	58	09	04
14	15	06	23	19	29	♑	10	06
14	19	07	24	20	00	43	12	07
14	23	08	25	20	01	36	14	09
14	26	09	26	21	02	31	15	10
14	30	10	27	22	03	29	17	11
14	34	11	27	23	04	28	18	13
14	38	12	28	24	05	27	20	14
14	42	13	29	25	06	26	22	16
14	46	14	♐	26	07	25	23	17
14	50	15	01	26	08	27	25	19
14	54	16	02	27	09	30	27	20
14	58	17	02	28	10	34	29	22
15	02	18	03	29	11	39	♓	23
15	06	19	04	♑	12	44	03	25
15	10	20	05	01	13	50	05	26
15	14	21	06	02	14	58	07	28
11	18	22	07	03	16	08	09	29
15	22	23	07	04	17	20	11	♉
11	26	24	08	05	18	34	13	02
15	31	25	09	06	19	49	15	03
15	35	26	10	07	21	05	17	05
15	39	27	11	08	22	23	19	06
15	43	28	12	09	23	42	21	07
15	47	29	13	10	25	05	23	09
15	51	30	14	11	26	30	26	10

A Table of Houses, for the Latitude of 52 degrees.

☉ in ♐										☉ in ♍									
Time from noon.		10	11	12	Ascend		2	3		Time from noon.		10	11	12	Ascend		2	3	
		♐	♐	♍	♍		♓	♉				♍	♍	♒	♈		♉	♊	
h	m	D	D	D	d	m	D	D		h	m	D	D	D	h	m	D	D	
15	51	0	14	11	26	30	26	10		18	00	0	13	17	00	00	25	17	
15	56	1	14	12	27	57	28	12		18	04	1	14	18	02	40	26	18	
16	00	2	15	13	29	25	♈	13		18	09	2	15	19	05	21	28	19	
16	04	3	16	14	00	56	2	14		18	13	3	16	21	08	02	29	20	
16	08	4	17	15	02	30	5	16		18	17	4	17	22	10	40	♊	21	
16	12	5	18	16	04	08	7	17		18	22	5	19	24	13	17	2	22	
16	16	6	19	17	05	47	9	18		18	26	6	20	26	11	53	4	23	
16	21	7	20	18	07	28	11	20		18	31	7	21	27	18	27	5	23	
16	25	8	21	19	09	12	13	21		18	35	8	22	29	20	58	7	24	
16	29	9	22	20	11	00	15	22		18	39	9	23	♓	23	24	8	25	
16	33	10	23	21	12	50	17	23		18	44	10	24	02	25	44	9	26	
16	38	11	24	22	14	43	20	25		18	48	11	25	3	28	♉	11	10	27
16	42	12	25	23	16	40	22	26		18	52	12	27	5	00	32	12	28	
16	46	13	26	24	18	41	24	27		18	56	13	28	6	02	47	13	29	
16	50	14	27	25	20	45	26	28		19	01	14	29	8	05	00	14	♋	
16	55	15	28	26	22	51	28	♊		19	05	15	♒	9	07	08	15	2	
16	59	16	29	28	24	59	♉	1		19	09	16	2	10	09	15	16	3	
17	03	17	♍	29	27	12	2	2		19	14	17	3	12	11	20	18	4	
17	08	18	1	♒	29	♓	27	4	3	19	18	18	4	13	13	21	19	5	
17	12	19	2	2	01	48	6	4		19	22	19	5	15	15	18	20	6	
17	16	20	3	3	04	11	8	6		19	27	20	6	16	17	11	21	7	
13	21	21	4	4	06	36	10	7		19	31	21	8	17	19	02	22	8	
17	25	22	5	6	09	02	12	8		19	35	22	9	19	20	48	23	9	
17	29	23	6	7	11	33	13	9		19	39	23	10	21	22	32	24	10	
17	34	24	7	8	14	06	15	10		19	44	24	12	23	24	12	25	11	
17	38	25	8	10	16	42	17	11		19	48	25	13	25	25	51	26	12	
17	42	26	9	11	19	20	19	13		19	52	26	15	27	27	29	27	13	
17	47	27	10	13	21	58	20	14		19	56	27	16	29	29	04	28	14	
17	51	28	11	14	24	37	22	15		20	00	28	18	♈	00	♊	36	29	15
18	56	29	12	16	27	18	24	16		20	05	29	19	2	02	04	♋	15	
18	00	30	13	17	00	♈	00	25	17	20	09	30	20	3	03	20	1	16	

A Table of Houses for the Latitude of 52 degrees.

☉ in ♒									☉ in ♓								
Time from noon.	10	11	12	Ascend ♊		2	3		Time from noon.	10	11	12	Ascend ♋		2	3	
h	m	D	D	D	d	m	D	D	h	m	D	D	D	d	m	D	D
20	09	0	20	3	3	30	1	16	22	08	0	3	16	05	15	26	11
20	13	1	21	5	4	55	2	17	22	12	1	5	17	06	04	26	12
20	17	2	23	6	6	18	3	18	22	16	2	6	18	06	53	27	13
20	21	3	24	8	7	38	4	19	22	20	3	8	19	07	41	28	14
20	25	4	25	10	8	55	5	20	22	24	4	9	20	08	29	28	15
20	29	5	27	11	10	11	6	21	22	27	5	11	22	09	16	29	15
20	34	6	28	13	11	26	7	22	22	31	6	12	23	10	0	♌	16
20	38	7	29	14	12	39	7	23	22	35	7	13	24	10	49	1	17
20	42	8	♓	16	13	51	8	23	22	39	8	15	25	11	35	2	18
20	46	9	2	17	15	01	9	24	22	42	9	16	26	12	20	3	18
20	50	10	4	19	16	10	10	25	22	46	10	17	27	13	04	4	19
20	54	11	5	20	17	17	11	26	22	50	11	19	28	13	48	2	20
20	58	12	7	22	18	23	12	27	22	54	12	20	29	14	32	5	21
21	02	13	8	23	19	28	12	28	22	57	13	21	♍	15	15	5	22
21	06	14	10	25	20	32	13	28	23	01	14	23	1	15	58	6	22
21	10	15	11	26	21	34	14	29	23	05	15	24	3	16	42	7	3
21	14	16	13	28	22	35	15	♌	23	08	16	26	4	17	25	8	22
21	18	17	14	29	23	35	16	1	23	12	17	27	5	18	08	8	25
21	22	18	16	♉	24	34	16	2	23	16	18	28	6	18	50	9	26
21	26	19	17	2	25	32	17	2	23	20	19	♎	7	19	32	10	6
21	30	20	18	3	26	29	18	3	23	23	20	1	8	20	14	10	27
21	34	21	20	5	27	25	19	4	23	27	21	2	9	20	57	11	8
21	37	22	21	6	28	20	20	5	23	31	22	3	10	21	38	12	29
21	41	23	22	8	29	15	20	6	23	34	23	5	1	22	19	13	29
21	45	24	24	9	00	♋ 08	21	7	23	38	24	6	11	23	00	13	♏
21	49	25	26	10	01	01	22	7	23	42	25	7	12	23	41	13	1
21	53	26	28	11	01	53	23	8	23	45	26	8	13	24	22	14	2
21	51	27	29	13	02	44	23	9	23	49	27	9	14	25	02	15	2
22	01	28	♈	14	03	35	24	10	23	53	28	11	15	25	42	15	3
22	05	29	2	15	04	25	25	11	23	57	29	12	16	26	22	16	4
22	08	30	3	16	05	15	26	11	24	00	30	13	17	27	01	16	5

Chap. II.

To erect a Figure of the Heavens for any time in the yeare under the latitude of 52 degrees by help of the preceding Table.

HAving drawn a Figure of the 12 houses, in the forme of that described in the first *Chapter* of this Part, you must seek the signe and degree that the Sun is in that day, in which the Figure is to be erected, then on the head of the precedent Table finde the signe that the Sun is in, and the degree in the columne of the 10 house, against which in the first columne entituled [*Time from noon*] you shall finde certain houres and minutes, which houres and minutes you must always add to the houres and minutes afternoon of that day that you would erect a Figure for, and if the Aggregate exceed 24 houres, you must take 24 houres from thence, and the remainder is to be sought in the first columne, entituled [*Time from noon*] and directly against that in the collaterall columne you shall finde the signes and degrees that are in the cuspes of 6 of the houses of heaven, namely in the 10, 11, 12 *Ascendent*, 2 and 3, as may be seen in the front of the Table. The other 6 houses have opposite signes but the same degrees, that the former six houses had, namely, the fourth house is opposite to the 10, the 5 to the 11, the 6 to the 12, the 7 to the *Ascendent*, the 8 to the 2, and the 9 to the 3 house: but that the opperation may be apparent take this example. I desire to erect a Figure according to the rationall way of *Regiomont. cap.* 13. for the middle time of the eclipse of the Moon, which is to happen the 16 of *May*, 1649, at two a clock 22 minutes in the morning. First, therefore, by the first Chapter of the second Part, finde the place of the Sun, which wil be the 5d. 7′. of ♊, with which enter the Table of Houses, and in the columne of the 10 house, in the Table, under the Title ☉ in ♊, you shall finde against the same in the first columne on the left hand, 4 houres, 12 min. to which adding 14 houre. 22 min. (the time afternoon that the eclipse happens) the Aggregate will be 18 houres, 34 min. with which, again, enter the Table of the Houses, finding the sum in the first columne on the left hand, entituled on the head; [*Time from noon*] and against the same toward the right hand, the 6 houses towards the Orient offer themselves thus to your view.

10	♍	07	45	By the oppoſite	4	♋	07	45	
11	♍	22		Signes the other	5	♋	22		
12	♎	29		ſix Occidentall	6	♌	29		
Aſcend	♎	20	20	Houſes are to bee	Deſcen.	♍	20	20	
2	♏	07		found, as here ap-	8	♐	07		
3	♏	24		pears.	9	♐	24		

Theſe

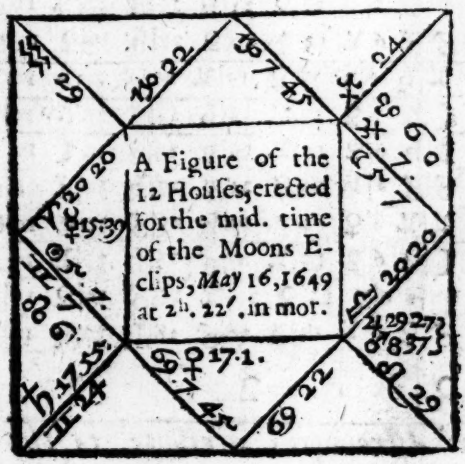
Theſe ſignsand degrees thus found, are to be placed on the cuſpe of each houſe, beginning with the 10 houſe, on the cuſpe whereof, place 7 d. 45′ ♍ on the cuſpe of the 11 houſe ♎ 22 d. and the reſt in their order, as in the following Figure they are inſerted.

The 12 Signes being placed in the figure, we muſt next enquire for the places of the ſeven Planets, with the Dragons Head and Taile, for the time of the middle of the foreſaid Eclipſe, which according to the *Rudolphine* Tables of that excellent Mathematician *Jo. Kepler*, are as followeth.

	d	m	
♄	17	55	♊
☿	29	27	♍ Stat.
♂	08	37	♍
☉	05	07	♊
♀	17	01	♋
☾	15	39	♌
☊	05	07	♐
☋	05	55	♊
☊	05	55	♐

But thoſe who are deſtitute of that, or the like Books, may make uſe of the Ephemerides of *Eichſtadius*, or of my Almanack, for the yeare 1649, entituled, *Speculum Anni:* In which the places of the ſeven Planets may be found, to which I refer you,

The places of the Planets being thus found, conſider under what Sign any of them falleth which being obſerved, note which of the Houſes



contain the Signe in which the Planet is, obſerving the number of degrees, and in due order, place the Planet in that Houſe, and when a Planet contains a leſſe number of degrees then the Cuſpis of the

the House, he is then to be placed (before the Cuspis) in the precedent House, but if greater, then he is to be placed beyond the Cuspis, according to the sequell and consequence of the Signes, as in the Figure.

Significationes domiciliorum Cœlestium teneantur hi Versus:

1 2 3 4 5 6

Vita, Lucrum, Fratres, Genitor, Nati, Valetudo,

7 8 9 10 11 12

Uxor, Mors, Sacra, Religio, Benefactaq; Carcer.

A Table of the Essentiall Dignities of the PLANETS.

Sigges	House	Exalt.	Trip d	Trip n	The Termes of the Planets.	The Faces of the Planets.
♈	♂	☉	☉	♃	♃ 6 ♀ 14 ☿ 21 ♂ 26 ♄ 30	♂ 10 ☉ 20 ♀ 30
♉	♀	☾	♀	☾	♀ 8 ☿ 15 ♃ 22 ♄ 26 ♂ 30	☿ 10 ☾ 20 ♄ 30
♊	☿	☊	♄	☿	☿ 7 ♃ 14 ♀ 21 ♄ 25 ♂ 30	♃ 10 ♂ 20 ☉ 30
♋	☾	♃	♂	♂	♂ 6 ♃ 13 ☿ 20 ♀ 27 ♄ 30	♀ 10 ☿ 20 ☾ 30
♌	☉	☋	☉	♃	♄ 6 ☿ 13 ♀ 19 ♃ 25 ♂ 30	♄ 10 ♃ 20 ♂ 30
♍	☿	☿	♀	☾	☿ 7 ♀ 13 ♃ 18 ♄ 24 ♂ 30	☉ 10 ♀ 20 ☿ 30
♎	☿	♄	♄	☿	♄ 6 ♀ 11 ♃ 19 ☿ 24 ♂ 30	☾ 10 ♄ 20 ♃ 30
♏	♂	☋	♂	♂	♂ 6 ♃ 14 ♀ 21 ☿ 27 ♄ 30	♂ 10 ☉ 20 ♀ 30
♐	♃	☊	☉	♃	♃ 8 ♀ 14 ☿ 19 ♄ 25 ♂ 30	☿ 10 ☾ 20 ♄ 30
♑	♄	♂	♀	☾	♀ 6 ☿ 12 ♃ 19 ♂ 25 ♄ 30	♃ 10 ♂ 20 ☉ 30
♒	♄	♄	♄	☿	♄ 6 ☿ 12 ♀ 20 ♃ 25 ♂ 30	♀ 10 ☿ 20 ☾ 30
♓	♃	♀	♂	♂	♀ 8 ♃ 14 ☿ 20 ♂ 26 ♄ 30	♄ 10 ♃ 20 ♂ 30
	5	4	3		2	1

Note that Astrologers attribute to the House 5 *Dignities, To the* Exaltation 4, *To the* Triplicity 3, *To the* Terme 2, *And to the* Face 1.

CHAP.

Chap. III.
The uſe of this Table briefly.

HAving ſhewed you (as briefly as may be) how to erect a Figure of the Heavens for any moment of time in the yeare, it remaines now to ſhew you, (likewiſe) the manner how to find out that Planet which ſhall rule in every of them, that is to ſay, the Planet which ſhall have moſt dignity and greateſt ſtrength in that place, or ſigne therein collocated. If then you would know what Planet is Lord of the 10 Houſe, looke what ſigne and degree is in the *Cuſpis* thereof, and with that ſigne and degree enter the Table of the dignities of the Planets, finding out the ſigne in the firſt columne on the left hand, and in the line againſt the ſame ſhall appeare all the eſſentiall dignities of the Planets: as for example, Suppoſe the 10 degrees of *Aries* be in the 10 Houſe (or in any other) and you would know the Lord thereof, therefore caſting your eye upon the Table of the dignities of the Planets, you ſhall find the ☉ is exalted in *Aries*, and therefore hath five dignities, and three for a Triplicity, becauſe the queſtion was by day, and *Mars* becauſe *Aries* is his Houſe, he hath there five dignities, and one by a face, *Jupiter* alſo Lord of a Terme, hath there two dignities, the Sun is therefore Lord and Almuten of the 10 Houſe, becauſe hee ſurmounts any of the other Planets in fortitudes.

Moreover, to know what Planet is Lord of an Eclipſe, wee muſt conſider what Planet hath moſt dignities in the Aſcendant, the *medium Cœli*, and the place Eclipſed, and he that is ſo dignified, is the Almuten of the Eclipſe; Notwithſtanding *Ptolomie* wills us to take the Eclipticke place, and the angle following, and from thence elect the Lord.

Now according to the former doctrine, *Mercurie* is principall Lord and Almuten of the Lunar Eclipſe before mentioned in *Jan:* 1647, becauſe he farre exceeds any of the other Planets in fortitudes, he having (in the Aſcendant, *medium Cœli*, and place of the Moon, 18 dignities.

Chap. IV.
Touching the effects of Eclipſes.

IN an Eclipſe (which poureth forth its greateſt influences upon Provinces, Cities, and men) ſeven things are obſervable; namely, the Lord of the Eclipſe; The fixed Starres preceding the E-

cliptick place; The Asterismes wherein the Eclipse happens, and in which the Lords of it exist: The signe in which the Eclipse is; The quantity of the Eclipse, and lastly the colour thereof.

The Lord of the Eclipse and the Signifier thereof is some of the Planets, of the which *Saturne* bringeth all evils, *viz.* Corruption proceeding from Cold, Consumptions, Feavers of the fourth degree, and daily diseases: also exile, povertie, vaine feare, death both of men and beasts, and dangerous tempests on the Sea. *Iupiter* causeth things to encrease, he createth tranquillity, peace, glory, a good temperature of the ayre, fertility of fruits; but if malignant, he produceth the contrary things. *Mars* having the dominion in the Eclipse, is by his fervour the cause of corruption, likewise of Warres, tumults, dissentions, cholerick diseases, violence, injurie, pestiferous heat, tempest, lightning, and drinesse. *Venus* having the dominion effecteth things in the same manner which *Jupiter* doth, but with a certaine grace, or pleasantnesse, *viz.* Glory, honours, mirth, fertile yeares, fortunate Marriages, a numerous off-spring, and a frindly season. *Mercurie* having rule, doth insinuate himselfe into the nature of that Starre, with which he shall be joyned, otherwise of all the Planets he is most violent: hence he maketh men witty, industrious, hypocriticall, and causeth Chamæleons, hot diseases, Coughes, strifes in Ecclesiasticall and Civill affaires, vehement windes, and thunder: Such force hath this Planet by himselfe, when onely having dominion in the Eclipse; but it doth very much change when he mingles his vertue with other Planets. Furthermore, the same nature which is attributed unto the Planets, is also attributed unto the fixed Starres. Thirdly, the Asterisme in which the Eclipse doth happen, doth so worke, that if their formes be of men, they have an influence upon humane kinde, if of foure-footed beasts, upon foure-footed beasts; if of Serpents, upon Serpents, &c. Fourthly, the signes in which the Ecliptick place, or the Starre of a prevailing authority is, doe signifie the diversity of the quarters of the Yeare; as in the *Spring-time*, sowing and springing forth; in *Summer*, Harvest; in *Autumne*, Fruits; in *winter*, Birds, Fishes, &c. Likewise for the diversitie of the Quadrangles; for the Equinoctiall signes have relation unto Religion; the Tropick unto the Commonwealth, and Lawes, the solid, or fixed, unto the foundations and substructions of houses: the double formed unto men and Kings. Fiftly, the place of the Eclipse, and the Ruler thereof is diligently to be observed, *Ratione cardinum & domorum*; for the angle of the East hath respect unto the first beginnings of things, to the age of man, to the Spring-time, to flowers, Education, first rudiments of knowledge, and foundation of Houses; The middle of heaven, hath re-

spect

ſpect unto the perfection of things unto Harveſt, ripe Age, Kings Temples, Towers: The ſetting doth reſpect the downfall and decaying of things, and that which is neere unto a period; as old age, and the mutation of Lawes. Sixtly, in reſpect of the quantity; as for a little Eclipſe it doth ſmall injurie, for its effects are not great; a meane Eclipſe worketh more, and a great Eclipſe moſt of all. Seventhly, the colour of the Eclipſe is conſiderable: A blacke colour, and ſomewhat blew, doth denote *Saturnine* effects, a white *Joviall*, a red, *Martiall*, a yellow, *Veneriall*, and a varying, *Mercuriall*: And if the colour ſhall ſpred it ſelfe through the whole bodies of the Luminaries, or the neighbouring region of heaven, it doth threaten very many Provinces, but if the colour ſhall remaine in one part, unto which it encline th it ſelfe, unto the ſame part of the Region ſhall the event decline alſo.

Eclipſes maximè agunt in illas regiones, quæ ſunt ſub ſigno Ecliptico, vel illi ſunt familiares: tum in homines, quorum nativitates conſentiunt cum themate Eclipſios: & denique in illa loca, quibus Eclipſes verticales ſunt, vel præcipui ſignificatores per verticem tempore Eclipſis præcedunt.

Item, *Quot horas durat Eclipſis Solaris, tot annorum duraturos effectus prænunciat: quot horas durat lunaris, tot menſium.*

Chap. V.

Of the name of diverſe Regions, Cities, and Towns, ſubject to the 12 *Cœleſtiall Signes.*

Under Aries *and* Mars *are theſe Regions.*

♈ ♂ England, France, Germanie, Suevia, Sileſia, *the higher* Polonia *the leſſe*, Denmark, Syria, Paleſtina: *and of Cities and Towns* Naples, Anconia, Capua, Ferraria, Florence, Verona, Lindavia, Trajectum, Padua, Brunſwick, Cracovia.

Under Taurus *and* Venus.

♉ ♀ Ruſſia, Polonia *the great*, Ireland, Lorrain, Campania, Helvetia, Rhetia, Franconia, Parthia, Perſia, *the Iſlands of* Cyclades, Cyprus, *and the ſea Towns of* Aſia the *leſſe*: *Of Cities and Towns*, Bononia, Sena, Mantua, Tarentum, Sicilia, Parma, Brixia, Tigure, Laçerne, Nanez, Lipſig, Poſnania, Gneſnam.

Under Gemini *and* Mercury.

♊ ☿ Sardinia, *part of* Lombardie, Flanders, Brabant, *the Dukedome of* Wertemberg, Hircania, Armenia, Syrenaica *and* Ægypt *the lower*: *of Cities and Towns*, London, Corduba, Turinum, Vercellas, Lovaine, Bruges *in* Flanders, Moguntia, Bamberg, Norimberg.

Under Cancer *and the* Moon,

♋ ☾ Scotland, Granado, Burgundia *the lower*, Holland, Zeland, Prussia, Numidia, Africa, Bithynia, Phrygia, Colchis, Carthage: *of Cities and Towns*, Constantinople, Tunis, Venice, Genoa, Luce, Pisa, Millain, Vincentia, Berne, Yorke, S. Andrews, Lubeck, Madgberge, Wittenburge, Gorlick.

Under Leo *and the* Sun.

♌ ☉ Gallia Togata, The Alpes, Italy, Sicily, Apulia, Bohemia, *a part of* Turkie, Phœnicia, Chaldæa: *and of Cities and Towns*, Damascus, Syracusa, Rome, Ravenna, Crémona, Ulms, Confluence, Prague, Lintz, Cremisum.

Under Virgo *and* Mercury.

♍ ☿ Achaia, Greece, Creete, Corinthia, Arthesia, Rhodes, *a part of* Gallia Comata, *a part of* Rhine, Sylesia *the lower*, Mesopotamia, Babylon, Assyria: *of Cities and Towns*, Hierusalem, Corinth, Novaria, Cüma, Brundusium, Papis Tholosa, Lyons, Paris, Basil, Hudelberge, Erphord, Uratislavia.

Under Libra *and* Venus.

♎ ♀ Austria, Alsatia, Livonia, Sabaudia, Delphinate, Thuscia, Bactriana, Caspia, Thebais, Troloditicam: *and of Cities and Towns*, Lisbone, Arles, Cajeta Lauday, Placentina, Friburge, Argentine, Spires, Francford *upon* Moene, Hal *in* Suevo, Heilbrunne, Frisinga, Mosbachium, Landeshute, Vienna *in* Austria, Antwerp.

Under Scorpio *and* Mars.

♏ ♂ Norway *the higher*, Bavaria, Comagena, Cappadocia, Idumæa, Mauritania, *the Kingdom of* Fesse, Gethulia, Catalonia: *and of Cities and Towns*, Algires, Valentia *in* Spain, Trapezant, Urbinum, Aquileia, Pistorium, Tarvisium, Forum Julium, Messana, Vienna *in* France, Monachium, Francford *upon* Oder.

Under

Under Sagitarius *and* Jupiter.

♐ ♃ Spain, Dalmatia, Slavonia, Hungarie, Moravia, Miſnia, Celtica, Arabia *the happy: of Cities and Towns,* Toletum, Volateras, Mutinum, Narbone, Avenion, Colonia Agrippina, Stagarde, Buda.

Under Capricorn *and* Saturn.

♑ ♄ Macedonia, Illyris, Thracia, Albania, Bulgaria, *part of* Greece, Mazovia, Lituania, Saxonia, Haſſia, Thuringia, Stiria, India, *and the Iſlands of* Orcades, *and of Cities and Towns,* Oxford, Juliacum, Clivia, Berges, Mechlin, Gaunt, Vilna. Brandenburg, Auguſta, Vindel, Conſtance, Fervence.

Under Aquarius *and* Saturn.

♒ ♄ Amazonia, Sarmaria, *great* Tartatia, Valachia, Moſcovia, *the South part of* Swedland, Weſtphalia, Moſel, Piemont, *part of* Bavaria, Æthiopia, Sogdiana, Media, Arabia *the Deſert: & of Cities,* Hamburrough, Breme, Monsferrat, Piſaurum, Trent, Ingolſtade.

Under Piſces *and* Jupiter.

♓ ♃ Cilicia, Calabria, Portugall, Galitia, Normandie, Garomantes, Lydia, Phamphylia, Ægypt *the higher: of Cities & Towns,* Alexandria, Hiſpalis, Compoſtella, Wormes, Ratisbone.

Chap. VI.

Of the portent and ſignification of Eclipſes according to Proclus.

Proclus (an excellent Mathematician of his time) obſerves, that an Eclipſe of either Luminary hapening in ♉ ♍ or ♑, prenotes great lacke and ſcarcity of Graine, and Fruit, eſpecially of thoſe things ſowne and planted: If it fall in ♊ ♎ or ♒, it portends famine, great ſickneſſe, peſtilent diſeaſes, and the like. If in ♋ ♏ or ♓, death of the ignoble and common people, long continuing troubles, Warres, great death of Fiſhes, Water-fowles, and of other Creatures living in the Sea. And if it ſhall be in ♈ ♌ ♐, it hath ſignification of Wars, great drought, Seditions, Controverſies, Sickneſſe, &c. But more particularly we will here ſet down

in

in Latine, as we finde them in *Junctione*, and others, touching their portents in the Decades of every signe.

☉ Effectus judiciarii ab Solis eclipsin per decanos singulos.

Solem laborare visus fuerit in aliquo ex primis decem gradibus ♈, crebros armorum & exercituum motus portendit, continuásque expeditiones, & insultus bellorum cum tumultu plurimo; Seditiones, controversias, & intemperiem aëris ad siccitatem potissimum urgentis.

In sequenti verò decano regis carcerem, mœrorem, aut mortis periculum, arborúmque fructiferarum corruptionem, ac terra nascentium putredinem.

In ultimo denario, tristitiam, & luctum affert mortalibus, magnæque mulierum obitum, & ad hæc pecudum perniciem minitatur.

In ♉ verò denario primo negotiatores affligit, & irrata tractare cogit, omniáque eorum negotia subruit; satis quóque & segitibus obest.

In altero decano peregrinantibus parturientibúsque parat incommoda.

In postremis pestemque, famémque inducit.

In ♊ primis gradibus Sacerdotibus, & in quovis ordine sacris initiatis dissentionem, lites & seditiones aggerit: odia infanda, legum contemptum, & pietatis etiam neglectum concitat.

In 10 mediis latrocinia, maritima & cædes.

In ultimis 10 regis obitum, & status publici detrimenta varia, civiliúmque negotiorum irritos eventus.

In ♋ 10 primis gradibus aërem perturbat, magnáque exagitat varietate.

In secundo decano fluvios & fontes exciccat incontinentiam, & petulantiam mortalibus intentat.

In ultimis 10 gradibus, per universam Armeniam, & Africam, cæteraſq; regiones Cancro subjectas, morbos, seditiones, & lues alias immittit.

In ♌ denario primo summi alicujus principis mortem, & rei frumentariæ penuriam præmonstrat.

In secundo, regis, magnatum, & procerum, anxietates & detrimenta minitatur.

In vlt: captivitates, obsidiones, direptiones, & ædium Sacrarum profanationes.

In ♍ decano primo, calamitosum regis alicujus exitum, & Stragem arguit.

In

In ſecundo, famem, peſtem, & ſeditiones mortalium.

In ultimo, pictoribus, poetis, & Mercurialibus, qui ingenio vigent, adverſa omnia, cædes, exilium, & ſimilia.

In 10 primis grad: ♎ aërem corrumpit, peſtem ſuſcitat, & annonam flagellat, earámque reddit.

In mediis magni regis mortem, ſeditiones, & famem portendit.

In ultimis Nobilium controverſias, & fortunarum detrimenta.

In ♏ denario primo tumultus bellicos movet; cædes, odia, captivitates, & proditionis machinatur.

In medio, regis cujuſpiam perniciem, averſum exercitus animum, & ſimilia.

In ultimo alienigenæ tyranni adventum, ignaviam, atque ſocordiam prioris regis omnibus inviſam.

In 10 primis ♐ grad: ſeditiones inter mortales manifeſtas oſtendit, & ab omni conſenſu, concordiáq; ab alienationem.

In 10 mediis, Camelorum, rudentumq; jumentorum ac cæterorum ejusgeneris veterinorum animalium interitum.

In ultimis, & equos, & exercitus multifariam affligit.

In ♑ decano primo, infœlices habet magnorum virorum caſus, regis alicujus tranſmigrationem, nobilium, & plebis rebelliones.

In medio denario, juratos milites in imperatorem ductoreſq; ſuos irritat, conatuſq; eorum erritos, aut infœlices eventus facit.

In poſtremo tumultuarium regis motum ſit famem inducit.

In ♒ primis 10 grad: publici mœroris & luctus materiam præbet.

In 10 mediis, latrocinia publica, furta, rapinas, terræ motuſq; & famem comminatur.

In ultimis, ovium, agreſtiumq; brutorum ejuſmodi interitum innuit.

In ♓ decem primis gradibus fluvios exiccat, maritima infortunat.

In medio decano, clari, præſtantiſq; viri mortem, ac in maritimis regionibus piſcium vaſtitatem, terræq; motum facit.

In ultimo denario, ſeditionem, crudelitatem, ferociam, inhumanitatem militum extimulat.

Super Eclipſi Lunæ. *Proclus* idem.

In ♈ decem primis gradibus obſcurat Luna, febris futuras, adjum incendia, combuſtiones nemorum, ac aëris ſiccitatem oſtendit.

In medio denario, peſtilentiam.

In 10 ultimis grad: abortivos partus & incommoda, periculáque hujuſmodi alia in mulieribus.

In ♉ *denario primo, nece, morboq; grassatur in pecudes.*

In 10 *mediis gradibus, reginæ obitu, & satorum seminumq; sterilitatem immittit.*

In ultimis, in serpentes, & reptilia sævit.

In ♊ *decem primis grad: incursiones & rapinas hostium minitatur.*

In 10 *mediis, repentinos exercituum motus, privatarum, publicarumq; rerum sollicitationes.*

In ultimis præstantis fama viri obitum ostendit.

In ♋ *denario primo, bellum omnino concitat.*

In secundo, exactiones acerbas, tributa intolerabilia, & hujusmodi onera portendit.

In ultimo, sexui muliebri morbos subitas, miseras, repentinasque neces minuitatur.

In ♌ 10 *primis gradibus, vel celerem regis alicujus infirmitatem, vel præclari cujuspiam viri mortem adducit.*

In, 10 *verò mediis, regis iter, & aliquam rerum mutationem accersit.*

In ultimis, exercitus populosque excitat ad res novas.

In ♍ *decano primo, ægrotationes regum inducit, atque hominum varias discordias & seditiones.*

In secundo in Consultores scribas & hujusmodi hominum forense genus perniciem parat.

In ultimo, mortalibus morbos affert.

In decem ♎ *primis gradibus, grandines et fœdas alias tempestates provocat.*

In 10 *mediis vitiligenis omnibus perniciosa est.*

In ultimis, magni clarique viri interitum minatur.

In ♏ 10 *primis gradibus, horrendæ tonitrua et fulgura portendit, & interdum terræ motum.*

In decem verò mediis, olivas et aërem exsiccat, & febres æstuosas facit.

At in ultimo decano, eadem minitatur, atq; insuper inter mortales plurimum sævit morbo, rixis, seditionibus cædibusque.

In ♐ 10 *primis grad. latrocinia, & rapinas immittit.*

In 10 *mediis in equos, & in mulas desævit.*

In ultimis pestem afflat, & mala inter mortales plurima.

In ♑ *decano primo suggillationes in homines movet & præstantis alicujus viri pernicioſam cædem ostendit.*

In medio decano primo crebros militum insultus, incursiones crebras, latrocinia & captivitates.

In ultimo, regis alicujus mortem & seditionem.

In ♒ 10 *mediis sementem lædit universam.*

In ultimis insignem rerum omnium mutationem facit, qua tamen, quicunque graviora perpessi fuerint, à malis liberentur.

In ♓ *denario primo, sacerdotibus, & æditibus, antistibusque luctum, & mœrorem affert.*

In

In medio, magni, præſtantiſq; viri obituum.
In ultimo, latrocinia & rapinas terra mariq; promiſcuas imitatur.

Thus much concerning the portent of Eclipſes, acording to *Proclus*, Now followeth certaine ſelect *Aphoriſmes* of approved Authors.

Hermes (a moſt ancient Aſtrologer) in the 53 Propoſition of his *Centiloquium*, ſaith thus.

Many troubles and damages will enſue, and come to paſſe in the World, when there ſhall happen Eclipſes of both Luminaries in one Moneth, but eſpecially, in thoſe places which are ſubject to the Eclipſed Signes.

Ptolomie, Aphoriſmo 24.

Eclipſes of the Luminaries hapning in the Angles of the Nativity, yearely Revolutions, is hurtfull. And they take the time from the diſtance, which between the Aſcendent and the place of the Eclipſe; and as from the houre of the Suns eclipſe, you take yeares, ſo from the houre of the Moons eclipſe, you muſt take moneths. See *Ptol. Lib. 2. Quadripart. Cap. 6. De tempore eventuum.*

Alſtedius lib. 17. Cap. 9. or fol. 1096. Encyclopædiæ.

If there be an Eclipſe, eſpecially of the Sun, and the principall Ruler thereof be *Mars*, chiefly being in a fiery or aëry Signe, *Mars* alſo being ſtrong, and having the Rule over the Yeare, it threatneth houſe burnings.

Moreover, if *Saturne* be Lord of the place eclipſed, and be ſtrong in watery or earthly ſignes, *Mars* being alſo joyned with Stars of a *Saturnine* nature, or elſe joyned to *Saturne* by body; Quadrate or Oppoſite aſpect, it portends an Earthquake and Inundations, *Nam pendent hæc maximè à ♄ in ſignis aqueis & terreis.*

Meſſahalah, Cap. 5. & ſeq.

Meſſahalah upon the Eclipſe of the Moon, would have us find the Aſcendent of the middle of the Eclipſe, and the Planet that ſhall be Lord thereof, as alſo of the Figure, and ſaith, If he ſhall be a Maligne, it portends great damage and detriment to enſue, but if he ſhall be a Fortune, or a Planet of a benigne nature, it denotes an agreement and good concurrence of things; and further ſaith, when the Eclipſe of the Moone ſhall be in cold, or watery Signes, it ſignifies much cold and abundance of raine, eſpecially if it be in Winter; but if it ſhall be in Summer, it preſages a temperate ayre, and when the fortunes (or fortunate Planets) ſhall behold the Moon by Aſpect, or ſhall be in reception of her, the ſignification thereof is of good and gaine.

Touching the Eclipſe of the Sunne, the ſame Author, *Cap. 7. de Rebus Eclipſium*, delivers this as a generall maxime, *Scito quod in*

eclipſi Solis non poteſt fieri, quin ſignificetur aliquod magnum accidens, ſecundum quantitatem ipſius eclipſis. And he ſaith, That to know what the Eclipſe of the Sunne portends, we muſt get the Aſcendent of the middle of the Eclipſe, and the Planets predominant in the Figure, which if they ſhall be of a malevolent nature, they portend harme and damage; and the death of a King, and of great men; but if they be of a benevolent nature, they ſignifie Fortune, and a good ſtate and agreement of things. And know (ſaith he) that when the eclipſe of the Sun ſhal be in either of the three fiery Signes, *Aries*, *Leo*, or *Sagitarie*, it menaceth the death of Kings, Potentates, and great men: alſo Drineſſe, Barrenneſſe of the earth, and Famine. But if in the watrie Signes, *Cancer*, *Scorpio*, and *Piſces*, it preſageth abundance of Raine, and much hurt thereby; yet know, that the good Starres, when they ſhall be in aſpect thereof, they diminiſh the evill, *& è contra.* Underſtand alſo, that when Sunne or Moone ſhall be Hylech, or Alchocoden of ones Nativity, and ſhall be Eclipſed, they ſignifie to him (whoſe Hylech or Alchocoden they are) great peril of his life, or dangerous infirmities, except the Fortunes ſhall behold them.

Chap. VII.

To finde the time when the effects of any Eclipſe begins to operate, and how long they continue.

HAving thus farre treated of Eclipſes and their effects, and ſhewed what Regions, Provinces, and Cities are thereby principally concerned; I thinke it pertinent here to adde ſome Rules, whereby to finde the time when their Effects begin and end: wherefore obſerve at the middle of the Eclipſe, how far the Luminarie Eclipſed, is diſtant from its riſing, and how long it continues above the Horizon; which had, reduce them into minutes, and then ſay by the Golden Rule, if the whole continuance of the Luminarie Eclipſed above the Horizon, give 365 dayes, or one year, what ſhall its time from the riſing give? Multiply and divide, and the Quotient will yeeld your deſire; as for example. In the partie Eclipſe of the Moon that happens the 20 of *November* 1648, the Moons nocturnall arch (or length of the night) is 16 houres, 14 minutes, which being reduced into minutes, makes 974, and her diſtance from her riſing is 14^{h}, $38'$, which in minutes is 878. Now I increaſe 878 by 365, the Product is 320470, which being divided by 974 the Quotient will be 329, $\frac{1}{40}$ and ſo many dayes will it

be

be after the Eclipſe, ere the effects thereof begin to operate, which is about the 15 of *October*, 1649. Then according to the Rule formerly delivered, looke how many houres the Sunnes Eclipſe continues, ſo many yeares will the effects laſt, or ſo many moneths, if it be a Lunar Eclipſe; as in the Eclipſe of the Moon the 20 of *November*, before treated of, the totall duration is 3 houres, and 33 minutes, therefore the duration of the effects ſhall be 106 dayes (which is three moneths and a halfe, becauſe the Eclipſe continues three houres and a halfe) therefore the effects of the aforeſaid Eclipſe of the Moone, which happeneth the 20 of *November*, 1648, begins to take its effects the 15 of *October* 1649, and operates till the 29 of *January* 1650.

Thus much of Eclipſes and their effects; now followes other obſervations *Aſtrologicall.*

CHAP. VIII.

To finde the length of a Planetary houre, what Planetarie houre it is, and alſo what Planet governeth the ſame houre, either day or night.

OBſerve that in every artificiall day (be it long or ſhort) there are alwaies 12 houres, and as many in the night, but they are unequall; as imagine the length of the artificiall day to be 7 houres 21 minutes, yet therein is contained 12 Planetary, or unequall houres, for diſtinguiſhing whereof, we have added the following Rules and Table.

To know the length of a Planetary houre doe thus, finde the length of the day (as before is taught) then reſolve the houres thereof into minutes, allowing 60 thereof to each houre, and to the product, adde the odde minutes if there be any, the totall then divided by 12 will tell you the length of a Planetary houre.

EXAMPLE. Suppoſe the day be 10 hou. 20 min. long, and you would then know the length of a Planetary houre, therefore multiply 10 by 60 and the Product is 600, to which adding the 20 odde minutes, the ſumme is 620 which divided by 12, the Quotient will be 51′. 40″, and this is the juſt length of a Planetary houre, when the day is 10 houres, 20 minutes long: the like is to be obſerved for the night, but for more eaſe we have calculated the ſubſequent Table, which declareth it by inſpection onely.

A Table of the Planetarie, or unequall houres for every day and night in the Yeare.

The length of the artificiall day. Hou:	min:	The length of the planetary ho. For the Day. Hou:	Min:	For the night. Hou:	min:
6	0	0 30	0	1 30	0
6	30	0 32	30	1 27	30
7	0	0 35	0	1 25	0
7	30	0 37	30	1 22	30
8	0	0 40	0	1 20	0
8	30	0 42	30	1 17	30
9	0	0 45	0	1 15	0
9	30	0 47	30	1 12	30
10	0	0 50	0	1 10	0
10	30	0 52	30	1 7	30
11	0	0 55	0	1 5	0
11	30	0 57	30	1 2	30
12	0	1 0	0	1 0	0
12	30	1 2	30	0 57	30
13	0	1 5	0	0 55	0
13	30	1 7	30	0 52	30
14	0	1 10	0	0 50	0
14	30	1 12	30	0 47	30
15	0	1 15	0	0 45	0
15	30	1 17	30	0 42	30
16	0	1 20	0	0 40	0
16	30	1 22	30	0 37	30
17	0	1 25	0	0 35	0
17	30	1 27	30	0 32	30
18	0	1 30	0	0 30	0
18	30	1 32	30	0 27	30
19	0	1 35	0	0 25	0

To finde what planetary houre it is, and alſo what Planet reigneth that houre; you muſt learne at what houre and minute the Sun doth riſe upō your day propoſed, and alſo the true hour of the day at the time propoſed; then obſerve how many hours and minutes the ſaid time is after Sun riſing, the number of which houres multiply by 60, and to the Product add the odde minutes, if there be any, then the aggregate divided by the number of min: that a Planet reigneth, the Quotient will ſhew the number of the Planetary houre.

EXAMPLE.

Admit when the Sun riſeth at 8 of the clock, (as upon Munday the firſt of *January* 1648,) it doth, & it be required to know what Planetary houre it is at a 11 a clock before noon the

the ſame day; therefore becauſe 11 a clock is three houres after 8 the Suns riſing, multiply 3 by 60 and the Product is 180 which divided by 40 (for ſo many minuts are in a Planetary houre that day) the Quotient is 4 houres 30 minutes, therefore you may conclude, there are 30 minutes ſpent of the fourth Planetary houre.

Having found what Planetary houre it is, and would know what Planet doth reigne that houre, doe thus. Seeke the day of the weeke in the head of the following Table, and the houre of the day in the ſame columne, then againſt it in the firſt columne towards the left hand is the name of the Planet that governeth that houre of the day, and in the laſt columne, towards the right hand, is the name of the Planet that governeth the ſame houre by night.

EXAMPLE. Upon Munday the aforeſaid firſt of *January* 1649 it is required to finde what Planet reigneth at 11 before noone the ſame day, wherefore, according to the aforeſaid Rule you may finde there are 30 minutes ſpent of the fourth Planetary houre, therefore firſt finde Munday in the head of the Table, and 4 which is the Planetary houre, in the ſame columne under Munday, and againſt it you ſhall finde (in the firſt columne) the word *Mars*, therefore you may conclude, that *Mars* rules the 4 houre of the ſame day.

A Table ſhewing what Planet ruleth every houre of the day or night for ever.

Governours for the day.	Sunday	Munday	Tueſday	Wedneſday	Thurſday	Friday	Saturday	Governours for the night.
Sol	01	12	09	00	10	00	11	Iupiter.
Venus	02	00	10	00	11	01	12	Mars
Mercurie	03	00	11	01	12	02	00	Sol
Luna	04	01	12	02	00	03	00	Venus
Saturne	05	02	00	03	00	04	01	Mercurie
Iupiter	06	03	00	04	01	05	02	Luna
Mars	07	04	01	05	02	06	03	Saturne
Sol	08	05	02	06	03	07	04	Iupiter
Venus	09	06	03	07	04	08	05	Mars
Mercurie	10	07	04	08	05	09	06	Sol
Luna	11	08	05	09	06	10	07	Venus
Saurne	12	09	06	10	07	11	08	Mercurie
Iupiter	00	10	07	11	08	12	09	Luna
Mars	00	11	08	12	09	00	10	Saturne.

CHAP.

Chap. IX.

Of the properties and naturall effects of the 7 Planets.

HAving now given you some briefe Rules to finde what Planet raignes every houre in the yeare, we will here speake something of their Nature and Properties, using all the brevity that may be in respect of the unaptnesse of the Volumne.

♄ *Saturne* being well posited and affected, is like a grave Counsellour, and a man of authority, thinking of deepe matters, a lover of Secrets, Diligent, Solitarie, Studious, Covetous, and a Zelotype: Being evilly affected, he is an abject, a Pick-thanke, fearfull, given to Solitarinesse, Sad, Stubborne, Il-willy, Deceitfull, Slothfull, Dul a Lyer; By nature he hath relation to Husband-men, Masons, Black-smiths, Diggers in the Earth, Tanners, and the like.

♃ *Jupiter* is said to be the greater fortune, and of nature is benevolent, being well Scituate he maketh men honest, prone to good duties, Pious, Magnanimous, Verecundious, Modest, Wise, Diligent, Liberall, and yet Carefull of their own: but being evilly disposed he is more Prodigall and Stout. He Signifies Bishops, Church-Governours, Lawyers, Judges, Governours of Cities and Townes, and Ecclesiasticall persons.

♂ *Mars* being well affected is valiant, generous, hasty, given to war, fearing no danger, impatient of Servitude and injuries, not respecting Riches: But being badly seated, he is irefull, cruell prodigall, a tyrant, a murther, and the authour of discords and seditions. He hath relation to Captaines, Chyrurgions, Turks, Fire-workers, &c.

☉ *Sol* is the light and lamp of Heaven, and the most noble Planet; He is magnanimous, valiant, provident, a giver of long life and a healthfull body, he maketh men famous, wise, desirous of honours, having signification of Kings, Princes, Dukes, Marquisses, Earles and Potentates.

♀ *Venus* being well scituate, maketh men faire spoken, pleasant, fair, dilicate in gesture; given to pleasures, sociable, mercifull, &c. But being ill affected, she is effeminate, timerous, a lover of maids, sluggish, lustfull, a Zelotype, and given to idlenesse.

☿ *Mercurie* well seated, causeth a sharp wit, maketh men studious and capable of learning; being ill seated, he is subtile, crafty, malicious and a lyer. Of persons he signifies Philosophers, Poets, Mathematicians, Scriveners, Merchants, and the like.

☾ *Luna* maketh men unconstant, fearfull, prodigall, studious of Historics and given to Navigation and Planting: she signifies Messengers, Legats, Queens, Ladies, also common people, Fishers, Watermen and the like.

Ha-

Having shewed you that there are seven Planets, and how to know what Planet rules, it cannot be amisse in the next place to adde a word or two more of their natures, qualities, and dispositions, therefore understand that the fortunate Planets be *Jupiter* and *Venus*, the infortunate and malevolent are *Saturn* and *Mars*, and the indifferent be *Sol*, *Mercurius*, and *Luna*.

Now if so be two fortunate Planets be in conjunction, the effects thereby signified may be good, but if two infortunates be conjoyn'd, they simply produce malevolent effects, yet the coitus, or copulation of the indifferent Planets, is indifferent, that is mean, being neither good nor bad.

Also the good in conjunction, with the bad, is bad; the good with the mean is indifferent, and the bad with the mean is bad, as some write, but *Ptolomie* in the 63 Aphorisme of his *Centiloquium*, willeth us to judge the effects by the Planet that is most elevated, and predominant.

A Table shewing the inclination of the Aire, by the Aspects of the Planets.

	☾	☿	♀	☉	♂	♃	
♄	Moist, Remiss, Close, Snow,	Winde and Raine, Winde, Snow.	Cold raine, Misling, Cold-rain, Rain, Snow	Cold-ra Hail.th. Winde Warme	Thund Haile, stormy, Rhmiss,	Accor-ding to the rul-ing Plã.	*Ver, Æstas Autu. Hyems*
♃	Of the quality of the Signe.	Windy Thunder, Moist, Temperate	Very temperate.	Winde, Thund. Winde, Remiss.	Turbul. Thund. Windy, Tempe.	*Ver, Æstas, Autum, Hyems.*	
♂	Hail, Heat, Intemperat Variable.	Raine, Snow, Thun. Hail. Wind, Snow	Rain, Mists, Raine-like, Remisse.	Dry win Thund. Dry win Warme	*Ver, Æstas, Autum, Hyems.*		
☉	According to the time and predõ. Planet.	Winde, and somtimes Raine.	Moist, Thunder. Raine, Mists,	*Ver, Æstas. Autum Hyems.*			
♀	Raine, Cold, Cloudy, Snow.	Sw. Showrs. Rain, Variable, Moist.	*Ver: Æstas: Autum, Hyems.*				
☿	Variable, of the nature of the Signe.	*Ver. Æstas. Autum. Hyeme.*					

Note

Note, that there is no great alteration of the aire, unlesse some of the superiour Planets be conjoyned or aspected.

Moreover, there are many other things, which (Astrologers say, and experience teacheth) are heedfully to be regarded before judgement ought to be given of the inclination of the air, as the Lord of the Lunation, the application and meeting of the Planets with the fixed Stars, the Absides, Climate, &c. all which with many other things, appertaining to prejudications are duly to be observed, the want or not observing whereof may cause grosse errours to ensue.

Chap. XI.

Naturall Prognosticks for the judgment of weather.

THe resounding of the Sea upon the shore: and the murmur of Winds in the Woods, without apparent wind, shew winde to follow; for such winds breathing chiefly out of the Earth, are not at the first perceived, except they be pent by water or wood. And therefore a murmur out of Caves likewise portendeth the same. The obscuring of the smaller Stars is a signe of tempests following. Also, if the Stars seem to shoot, winds from that quarter the Star came from.

The often changing of the winde also sheweth Tempests.

If two Rain-bows appeare, rain: a Rain-bow presently after rain, faire weather.

If the Skie be red in the morning, it is a sure token of windes or rain, or both; because those vapours which cause the redneſſe, will presently be resolved.

If the Sun or Moon look pale, look for rain; if fair and bright fair weather; if red winds, as the Verse hath it.

Pallida Luna pluit, rubicunda, flat, alba serenat.

If a dark cloud be at Sun-rising, in which the Sun soon after is hid, it will dissolve it, and rain will follow: if then appear a cloud, and after vapours are seen to ascend up to it, that portendeth rain.

If the Sun seem greater in the East then commonly it doth, it is a signe of rain.

If in the West about Sun-setting there appeare a black cloud, it will raine that night, or the day following, because that cloud shall want heat to dispersе it.

Serò rubens cœlum cras indicat esse serenum,
Sed si mane rubet, venturos indicat imbres.

If mists come down from the hils, or descend from the Heavens, and settle in the Vallies, it promiseth fair hot weather: mists in the evening shew a hot day on the morrow, the like when white mists rise from the waters in the evening.

Wa-

Water-fowles (as Sea-gulls, More-hens, &c.) when they flock and fly together from the Sea towards the Shores; and contrarywise, Land-birds (as Crowes, Swallowes, &c.) when they fly from the lands to the waters, and beat the waters with their wings, doe foreshew raine and winde.

The circles that appeare about the Sun, if they be red and broken, it portendeth winde: if thick and dark, windes, snow, or raine; which are also presaged by the circles about the Moone.

Pro die inspice Solem orientem, pro nocte occidentem.

The Trifole against raine swelleth in the stalke, and so standeth more upright; for by wet stalks do erect, and leaves bow down. There is a small red flower in the stubble-fields, which in some Countries is called the Wincopipe, which if it be open in the morning, you may be sure of a faire day to follow.

Even in men, aches, hurts, and cornes, doe engrieve, either towards raine, or towards frost.

Wormes, Vermine, &c. doe likewise foreshew raine: for earth-wormes will come forth, and Moles cast up more, fleas bite more against raine.

Solid bodies likewise foreshew raine; as stones and Wainscot when they sweat.

Prognosticks of Pestilentiall and unwholsome yeares.

It is observed by the Learned, that those yeares are Pestilentiall, and unwholsome, when there are great numbers of Frogs, Flies, Locusts, &c. The cause is plaine, for that those creatures being ingendred of putrefaction, when they abound, shew a generall disposition of the yeare, and constitution of the ayre, to diseases of putrefaction. And the same Prognostick holdeth, if you finde wormes in Oake-apples; for the constitution of the ayre, appeareth more subtilly, in any of these things, than to the sense of man.

Great and early heats in the Spring (and namely in *May*) without windes, portend pestilent yeares: and generally so doe yeares with little winde or thunder.

Great droughts in Summer, continuing till towards the end of *August*, and some gentle showres upon them, and then some weather againe; doe portend a pestilent Summer the yeare following: for about the end of *August*, all the sweetnesse of the Earth, which goeth into Plants and Trees, is exhaled; (and much more if the *August* be drie) so that then, nothing can breath forth of the Earth, but a grosse vapour, which is apt to corrupt the ayre: and that vapour, by the first showres, if they be gentle, is released, and commeth forth abundantly. Therefore they that come abroad soone after those showres are commonly taken with sickenesse. And in *Africk*, no body will stir

out of doores after the first showres. But if the showres come vehemently, then they rather wash and fill the earth, then give it leave to breath forth pleasantly. But if dry weather come againe, then it fixeth and continueth the corruption of the ayre, upon the first showres begun, and maketh it of ill influence, even to the next Summer, except a very frosty Winter discharge it, which seldome succeedeth such drought.

The lesser infection of the small Pocks, Purple-feavers, Agues, in the Summer precedent, and hovering all Winter, doe portend a great Pestilence in the Summer following; for putrefaction doth not rise to its height at once.

A dry *March*, and a dry *May*, portend a wholesome Summer, if there be a showring *Aprill* between: but otherwise it is a signe of a Pestilentiall yeare.

Non nobis solum nati sumus, sed partim Patriæ, partim Parentibus, partim amicis debemus.

Furthermore, because the ayre according to its scituation doth much alter and change the constitution of Mans body, and may breed pure and wholsome blood, or corrupt and bad blood, and malignant humours. Therefore that you may know what ayre is pure and sound, and what ayre corrupt and infectious, I will add some experiments, which the judicious have observed, whereby you may conjecture how the ayre is disposed, and that

A sound and pure ayre is

Made hot presently after Sunne rising, and is made cold presently after Sunne setting.

Which yeeldeth a pleasant smell after raine, cleere and not evaporated, open and lightsome, where the North Winde bloweth.

Where the East Wind bloweth in the Morning,

A corrupt and infectious ayre is

Made by the often blowing of the South, or South-East Winde, or by the South-West, or West in the Evening, which ingender sicknesses.

Where the ayre is cold long after Sunne-rising.

Where the ayre is long hot after Sunne-set.

Where the ayre is long close, cloudy, or thick.

The

The fourth Part:

Containing a deſcription of the Sphear or Globe, with an explaination of the Circles therein imagined: Alſo the ſeverall ſeaſons and ſhadows incident to all the Inhabitants of the World, with a deſcription of the Year and the parts thereof: Alſo the diſtances, magnitudes, and motions of the Planets and fixed Stars.

Chap. I.

A deſcription of the Sphear or Globe, and the Circles thereof.

A Sphear or Globe, by *Theodoſius*, is thus defined, *Sphæra eſt ſolidum una ſuperficie contentum, in cujus medio punctum eſt, a quo omnes rectæ lineæ ductæ ad ſuperficiem ambitentem ſunt æquales.* That is, A Sphear or Globe is a ſolid body, containing one ſuperficies, in whoſe middle there is a point, from whence all right lines drawn to the ſuperficies are equall. In this Sphear or Globe there are 10 imaginary Circles, whereof 6 are great, & 4 are ſmall: A great Circle is ſuch a one as divideth the body of the Gobe into two equall Hemiſphears, and a ſmall circle is that which divideth it into two unequall Hemiſphears, whereof one is more, and the other leſſe then halfe the body of the Globe or Sphear.

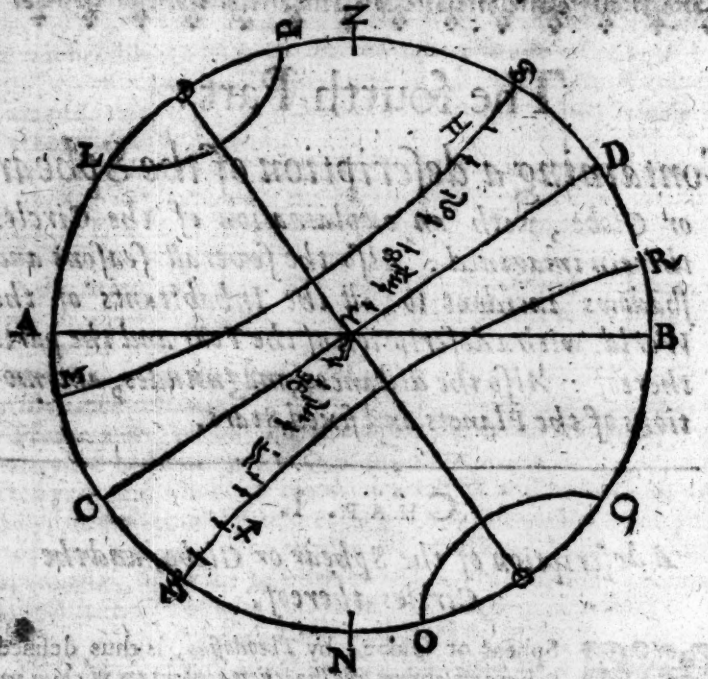
The 6 great Circles are theſe.

1 Horizon,
2 Meridian,
3 Æquinoctiall,
4 The Zodiack,
5, 6 The Colures.

The 4 leſſer Circles.

1 The Tropick of Cancer,
3 The Tropick of Capricorn
3 The Circle Artick,
4 The Circle Antartick.

A Figure of the Circles of the SPHEARE.



Of the HORIZON.

The Horizon, (which is also called the Finitor) is a circle which divideth the visible part of the heavens from the not visible, that is, the lower hemisphear from the higher, in the figure marked with A B.

Of the MERIDIAN.

The Meridian is a circle which passeth by the Poles of the World, and through the Zenith and Nadir, to which, when the Sun commeth above the Horizon, it is noon or mid-day, and being in the same circle under the Horizon, it is mid-night. The Zenith is an imaginary point in the heavens, directly over our heads, and the Nadir is a point opposite to the Zenith, directly under our feet. The Zenith is noted with Z, the Nadir with N, the Meridian with Z A N B.

Of the ÆQUINOCTIALL.

The Æquinoctiall is a circle dividing the whole Sphear into two equall parts, to which, when the Sun commeth (which is twice in the yeare) the dayes and nights are of equall length, throughout the World. This Circle is noted with C D.

Of

Of the ZODIAQVE.

The Zodiaque is a great circle which contains the 12 Signes, and comprehendeth on the one part the circle of *Cancer*, and on the other the circle of *Capricorn*, , cutting in the very middle, the Æquinoctiall in two points, which are the beginning of ♈ and ♎, whereof the one halfe declines towards the North, the other halfe towards the South. In the middest of this broad circle is a line called the Ecliptick, because that the Sun and Moon be never eclipsed but in that circle: And although the Sun doth never deviate from this ecliptical circle called *Via Solis*, yet the other Planets do. This circle hath on the Northern side the six Northern Signes ♈ ♉ ♊ ♋ ♌ ♍, which make the Spring and Summer: And on the Southern side the six Southern Signes ♎ ♏ ♐ ♑ ♒ ♓, thereby limiting Autumn and Winter.

Of the COLURES.

The Colures are two great circles, the one passing by the beginning of ♈ and ♎, called the Æquinoctiall Colure; and the other by the beginning of ♋ and ♑, and crosse each other with right angles in the Poles of the World, and is called the Solsticiall Colure. The Æquinoctiall Colure is that which passeth from the two Poles of the world, noted with ⊙ ⊙, and the Solsticiall Colure is the same with the Meridian circle, as the Sphear is here projected.

Of the foure lesser Circles of the Spheare.

Of the two TROPICKS.

The Tropick of *Cancer* (which is also called the Solstice) is a circle distant from the Æquinoctiall toward the North Pole 23 degrees 31 minutes, to which when the Sun commeth, he causeth the longest day and shortest night to all Northern, and the shortest day and longest night to al Southern inhabitants: this circle is noted with M♋.

The Tropick of *Capricorn* is a circle distant from the Æquinoctiall towards the South Pole 23 deg. 31 min. to which when the Sun attains hee maketh longest day and shortest night to all Southerne, and shortest day and longest night to all Northerne inhabitants, and is noted with M♑ R. These two circles are called of the Greeks Τροπικοὶ, *à convertendo*, because when the Sun toucheth any of these circles, he is at his greatest distance from the Æquinoctiall and returneth thither again.

Of the Circle ARTICK.

This circle is distant from the North Pole of the World so much as the Tropick of ♋ is distant from the Æquinoctiall, noted with L P.

Of the Circle ANTARTICK.

This Circle is distant from the South Pole, so much as the Tropick of ♑ is distant from the Æquinoctiall, marked with O Q.

CHAP.

Chap. II.

Of the diversity of Days and Nights, and of the divers seasons and shadows incident to divers places of the Earth.

1 **Of them, who are right under the Equinoctiall circle.**

IT is to be observed that they whose Zenith is in the Æquinoctiall circle have in one yeere two Summers, which are extreame hot, in regard the Sun twice passeth directly over their heads which is whe he is in the beginning of *Aries* or *Libra*. And have likewise two Winters, which commeth to passe when the Sun is in the first point of *Cancer* or *Capricorn*; for then the Sun is farthest distant from them (not withstanding their Winters are very warm, & not comparable in cold to ours) so that it appears that our two Seasons of Spring and Autumne, are to them two Summers, and our two Seasons of Winter & Summer, are to them two Winters. Moreover, they have four sundry shadows, for when the Sun is in either of the Æquinoctiall points, then in the morning they cast their shadows towards the West, in the afternoon they cast it towards the East; but at noon; their shadow is perpendicular, or right down: also when the Sun is in the Northern signes, then they cast their shadows towards the South, and when he is in the Southern, they cast them towards the North. Nevertheless their day is always 12 houres without variation, because they dwell in a right Sphear. Finally, they see all the stars towards the South Pole, and about the same, which are unknown to us, yea, they may see both the Poles at one instant, and therefore may behold all the Stars in the Firmament to rise and set, as by the Globe, or Sphear may appear: therefore *Lucan*, saith

Tunc furor extremos movit Romanus Horeas
Carmonásque duces, quorum sum flexus in Austrum
Æther non totam, merei tamen aspicit Arcton,
Lucet & exiguo velox ubi nocte Bootes.

But in our situation these stars never set, therefore *Virgil*,

Hic vertex nobis semper sublimis; at illum.
Sub pedibus Styx atra videt manésque profundi

And *Lucan* in another place:

Axis in Occiduus gemina clarissimus Arcto.

2 **Of them who dwell between the Æquinoctiall and Tropick of Cancer.**

Those, whose Zenith is between the Æquinoctiall and Tropick of *Cancer*, have the Sun passing by the Zenith of their heads twice in one year,

year, which may thus appear: Let there be imagined a parallel circle to the Æquinoctiall, passing by their Zenith; this circle will cut the Zodiaque in two places equally distant from the beginning of *Cancer*, therefore the Sun being in these two points passeth by their Zenith, so that they have two Summers and two Winters, and four shadows, as they have under the Æquinoctiall, some say *Arabia* is scituate under this Clime, whereupon *Lucan* speaking of the *Arabians* comming to *Rome* to help *Pompey*,

Ignotum vobis Arabes venistis in orbem,
Umbras mirati nemorum non ire sinistras.

Because that in their own Countrey their shadows was sometime on that right hand, sometime on the left, sometime perpendicular, sometime towards the East, and sometime towards the West, but when they came to *Rome*, which is on this side the Æquinoctiall of *Cancer*, then they had always their shadows at noon-tide toward the North.

3 **Of those, who live right under the Tropick of** Cancer.

Those people, whose Zenith is in the Tropick of *Cancer*, have the Sun but once in the yeer in their Zenith, which commeth to passe when he is in the first point of the *Dodecatemorie*, *Cancer* (the Sun being then in his Solstice) for their at Sun rising the shadow tendeth towards the West, at night when the Sun goeth down it tendeth towards the East, but at noon it is perpendicular, inclining on neither side, but falling right down, and under this Climate is the City of *Syene* scituated, so that *Lucan* speaking of the Zones.

——Calida medius mihi cognitus axis
Ægypto, atque umbras nusquam flectente Syene.

4 **Of those who dwell between the Tropick of** Cancer, **and the circle** Artique.

Those people, whose Zenith is between the Tropick of *Cancer* and the circle Artique have the Sun never Verticall over their heads, because he is no sooner atteined to his greatest Altitude, but immediatly he returneth again Southward, and therefore their shadow at noon always tends towards the North, and in this parallel are we scituate, and the greatest part of the inhabitable World, yet it is to be noted that *Æthiopia*, or some part thereof is in the Tropick of *Cancer*, according to *Lucan* in his third Book.

Æthiopúmque solum, quod non premeretur ab ulla
Signiferi regione poli, ni poplite lapso
Ultima curvati præcederet ungula Tauri.

5 **Of those that live right under the Circle** Artique.

They that have their Zenith in the circle Artique, have also at all times of the yeer the Zenith to be the Pole of the Zodiack, and have the Zodiack, or Ecliptick-line for their Horizon, so that the one half

in

in an inſtant riſeth above the Horizon, and the other part in the ſame inſtant goeth downe, therefore *Alfraganus* well obſerves: *Quod ibi occidunt repentè ſex ſigna, & reliqua ſex oriuntur cum toto Equinoctiali.* And ſeeing that the Ecliptick is their Horizon, the Tropick of *Cancer* muſt be all above the Horizon, and the Tropick of *Capricorne* all under the Horizon; So that the Sunne being in the firſt point of *Cancer*, their Artificiall-day is juſt 24 houres, and their night but a moment, for in an inſtant the Sun paſſeth the Horizon, and forthwith beginnes to aſcend from the North point towards the Eaſt: So contrariwiſe, it is to them when the Sun is in the firſt point of *Capricorne*, for then their night is 24 houres, and their day but a moment.

6 Of thoſe that dwell between the Circle Artique, and the Pole of the World.

Thoſe people that inhabite betweene the circle *Artique*, and Pole of the World, have their Horizon cutting the Zodiaque in two points, equally diſtant from the beginning of *Cancer*, and by the revolution of the Firmament, it happeneth that this portion of the Zodiaque intercepted, remaines alwaies above the Horizon, whereby it appeares, that when the Sun is in this part of the Zodiaque, they have continuall day and no night; therefore if this portion bee the quantity of one ſigne, their day is a moneth long, without a night. If the ſaid portion containe two ſignes, then their day is two moneths long; If three ſignes, three moneths long, and ſo the farther North, the longer day, till you come under the Pole *Artick*, where it is ſix moneths long, &c. Alſo to them it doth ſo fall out, that the portion of the Zodiaque, intercepted of thoſe two points, æquidiſtant from the beginning of *Capricorne*, is alwaies remaining under the Horizon, ſo that when the Sunne is in this poſition intercepted, the night is ſhort or long, according to the quantitie of the intercepted portion; But the other ſignes which riſe and ſet to them, riſe and ſet prepoſterouſly, or backward; As when *Taurus* riſeth before *Aries*, *Aries* before *Piſces*, *Piſces* before *Aquarie*, &c. Nevertheleſſe, the ſignes oppoſite to theſe, riſe in right order, and ſet prepoſterouſly, as *Scorpio* before *Libra*; *Libra* before *Virgo*, and yet notwithſtanding, the ſignes oppoſite to theſe, ſet directly, to wit, thoſe which riſed prepoſterouſly, or backward, as *Taurus*, *Aries*, *Piſces*, *&c.*

7 Of thoſe that dwell right under the Pole Artique.

Theſe people (if there be any) have the Pole for their Zenith, and the Equinoctiall for their Horizon; Wherefore ſeeing that the Equinoctiall divideth the Zodiaque exactly into two equal parts, it is thereby manifeſt, that ſix ſignes, (which is one halfe of the Zodiaque

diaque) is alwayes above the Horizon, and that ſix ſignes (which is the other halfe of the Zodiacke) is alwaies under their Horizon; So that when the Sunne runneth through that halfe, which is from the beginning of *Aries*, to the end of *Virgo*, it is continuall day without night; and when the Sunne runneth through the other halfe, which is from the beginning of *Libra* to the end of *Piſces*, it is continuall night without day, but yet it cannot be ſo darke there as elſewhere, by reaſon the Sunne is never depreſſed under their Horizon above 23 degrees, and 31 minutes which is, when he enters *Capricorne*,) wherefore the one halfe of their yeare is their artificiall day, and the other halfe of their yeare is their artificiall night; from whence it is, that the whole yeare is there but a naturall day, but yet it is as long, as 365 daies of ours. And albeit that the Sun is halfe a yeare together above their Horizon, yet he is never elevated above 23 degrees 31 minutes, whereby the day is intollerable cold at all times in the yeare, and the ayre is groſſe, cold, and cloudy, by reaſon that the beames of the Sunne are there but weake, and not able to exhauſt and conſume the groſſe vapours, which there abound.

Chap. III.

Of the Yeare, and the parts thereof.

THe Word *Annus*, is ſo called, *quaſi annulus*, becauſe (as the Greek word Ἐνιαυτὸς ſignifieth) *in ſe convertitur annus*: which was the reaſon why the Egyptians in their myſticall cyphers (called *litteræ hieroglyphicæ*) did uſe the picture of a Serpent, having his taile in his mouth, to ſignifie a yeare. Much confuſednеſſe hath been in the computation of the true Yeare; by *Romulus*, *Numa*, and *Julius Cæſar*, but that Computation, which *Julius Cæſar* found out, we have embraced, and doe at this day follow, calling our Yeare, *Annum Julianum*, and *Annum magnum*, having relation to the Monethly Yeare, called *Annus Lunaris*; and ſometimes this great Yeare is called, *Annus vertens*, *à vertendo*, becauſe it is alwaies turning, and running on. Moreover, we muſt remember that the *Romans* did begin their Yeare at *March*: whence that Moneth which ſince hath been called *Julius*, in the honour of *Julius Cæſar*, was by them called *Quintilis*, becauſe it was the fifth Moneth: and that Moneth, which ſince hath been called *Auguſtus*, in remembrance of *Auguſtus Cæſar*, was by them called *Sextilis*, becauſe it was their ſixt Moneth.

Thus then the great Yeare being divided into 12 Moneths, every

Moneth was divided into three parts, *id est*, *Calendas*, *Nonas*, & *Idus*. The Kalends were so proper unto the *Romans*, that *Augustus Cæsar*, when he purposed never to doe what he was requested, was wont by way of Proverbe to say, that he would doe it, *Ad Calendas Græcas*, that is to say in our *English* Proverbe, At Latter Lammas, [Never.] But for the better understanding of these Kalends, Nones and Ides, wee have inserted them in the 6 Columne of the left page of the *Ephemeris*, under the title [*The Latine Accompt*] against every day in the Yeare.

Dies Civilis continet,

Lucem, cujus partes sunt.

- Diluculum: The breake of Day.
- Mane: The full Morning.
- Ad meridiem: The Forenoone.
- Meridies *quasi* Medidies: Mid-day.
- Morus dies: Perfect day. Noone.
- De Meridie: Afternoon.
- Solis occasus. Sun setting.

Noctem cujus partes sunt.

- Crepusculum: The duske of the Evening.
- Prima fax: Candle light.
- Vesper: The Night.
- Concubium: Bed-time.
- Nox intempesta; The first Sleep.
- Ad mediam Noctem: Towards Mid-night.
- Media Nox: Mid-night.
- De media Nocte: A little after Mid-night.
- Gallicinium: Cock-crowing.
- Conticinium: All the time from Cock-crowing to the breake of day.

The day and night again were each of them divided into *primam*, *secundam*, & *quartam Vigiliam*, every Watch containing 3 houres. The first of the Night began at 6 of the clock in the evening, and the fourth ended at 6 in the morning. These Watches were distinguished by severall sounds of Cornets and Trumpets, that by the diversity thereof it might easily be known which Watch was sounded, and by consequence the time of the night. Moreover, the Romans upon a superstitious conceit and observations of mis-fortunate and evill events falling out on some dayes, and more happy successe upon others, have called the former sort of dayes *Atros dies*, or *dies postridianos*, & *Ægyptiacos*: and the latter sort they called *Albos dies*, borrowing the name from the Scythians, who used to chalke out the fortunate dayes in their Kalenders with white characters, whence *Horace* saith, *Cressa nonc ureat pulcra dies notâ.*

Othersome as their unfortunate dayes were noted with a black character, according to that, *Nigro carbone notatus.* Of

Of the diverſity of Moneths.

Of Moneths there be three kindes, *Solar*, *Lunar*, and *Vulgar*, or *Civill*. The moneth *Solar* (having relation to the motion of the Sun) is the ſpace of time that the Sun continueth in one Signe, which according to his mean or equall motion he performeth in 30 dayes.

The moneth *Lunar* dependeth upon the motion of the Moon, and is the ſpace of time in which the Moon runneth through the whole Zodiack beginning at ſome known point thereof, and returneth to the ſame point again, and this is called the Moneth *Periodiacall*, or of *Paragration*. Again, the ſpace of time contained from one conjunction with the Sun to the next, is called a moneth *Synodicall*: But *Johannes de Sacro Boſco* ſetteth down four kindes, *viz.*

The Moneth of	Paragration,	containing	27 dayes, 7 hou. 43 min. 7 ſec.
	Apparition,		28 dayes.
	Medicinall,		26 dayes 12 houres.
	Conſecution,		29 dayes 12 houres.

The uſuall moneth is a number of dayes according as they are in our Kalender, and amongſt the Latines *Romulus* firſt diſtinguiſhed the moneths dividing the yeare into 10 parts, as *Ovid* in this Diſtich.

Tempora digereret cum conditor urbis, in anno
Conſtituit menſes quinque bis eſſe ſuo.

The firſt moneth he called **March**, *à* Marte *patre ſuo*, of *Mars* his Father. The ſecond he called **April**, either, *ab aperiendo*, in regard the pores of the earth are then opened: or, *ab ἀφρῷ*, *unde*, ἀφροδίτη Venus *nomen habet*, διὰ τὴν ἐκ τοῦ ἀφροῦ γένεσιν *quoniam ex ſpumâ maris nata fuiſſe fingitur*. The third **May**, *à Majoribus*. Th fourth **June**, *à Junioribus*. The other moneths were called, **Quintilis**, **Sextilis**, **September**, **October**, **November**, **December**. To wit, **Quintilis**, becauſe it was five moneths diſtant from **March**. **Sextilis**, becauſe it was ſix moneths diſtant. **September**, becauſe it was ſeven moneths diſtant, as appears by that of *Ovid*.

Martis erat primus menſis, Veneriſque ſecundus,
Hæc generis princeps, ipſius ille pater,
Tertius à ſenibus, invenum de nomine quartus,
Quæ ſequitur numero turba notata fuit.

But *Numa Pompilius* following *Romulus*, added two moneths more, namely, **January**, and **February**. Whence *Ovid* in the ſame place.

At Numa *nec* Janum, *nec avitas præterit umbras*
Menſibus antiquis addidit ille duos.

January takes its name, *à* Janua, *quoniam non aliter per* Januarium, *in annum, quam per* Januam *in atrium fit ingreſſus*: Or of *Janus*,

who is fained to have two faces, ſo that **January** hath two reſpects, one to the yeare paſt, the other to the yeare to come. **Febzuary**, comes *à Februo, id eſt, Sacrifico*, becauſe then the Romans offered Sacrifice to *Pluto*, and other infernall gods for the ſoules of their Anceſtors.

Julius Cæſar who lived many years after *Numa*, perceiving the Lunar year to con-ain onely 354 dayes, he, by the advice of *Soſigenes*, (an excellent Mathematician) added 11 dayes ſix houres, making the year to conſiſt of 365 dayes 6 houres, which is called, *Annus Civilis*, and is ſtill uſed for the vulgar yeare. Moreover, he divided theſe 365 dayes into 12 moneths, giving to ſome 30, to others 31 dayes, orderly, but finding it to exceed a day in *anno communi*, he therefore tooke a day from **Febzuary**, which he again reſtored in *anno Biſſextili*, therefore in the time of *Julius*, in the beginning of the conſtitution of the *Julian year*, **January** had 31 dayes, **Febzuary** 29 in *anno communi*, 30 in *Biſſextili*, **March** 31, **Aprill** 30, **May** 31, **June** 30, **Quintilis** (which *Julius Cæſar* named **July**, according to his own name, in regard he was borne in that moneth) 31 **Sextilis** 30, **September** 31, **October** 30, **November** 31, **December** 30. *Auguſtus Cæſar* following *Julius*, called the firſt moneth **Sextilis**, **Auguſtus**, after his own name, grudging his moneth ſhould be ſhorter then **July**, and therefore he ſubſtracted one day from **Febzuary**, and added it to **Auguſt**, ſo that **Febzuary** hath but 28 dayes in *anno communi*, and 29 in *Biſſextili*. And becauſe he ſaw the three following moneths, **July**, **Auguſt**, and **September**, not conveniently to containe 31 dayes, therefore he tooke one day from **September**, and added the ſame to **October**, ſo likewiſe, he tooke one day from **November**, and added it to **December**, and ſo the 12 moneths called *Menſis civilis*, are numbred, as in our vulgar Kalenders at this time.

Chap. IV.

Of the fixed Starres, and ſeven Planets, their magnitudes, motions, diſtances, &c.

The whole Spheare of the fixed Stars is moved about the Poles of the Zodiack (contrary to their diurnall motion) from the Weſt into the Eaſt, and goeth every day 8 thirds, 25 fourths, 12 fifths: and their motion in longitude is alway equall, but the reaſon why they appeare unequall, commeth to paſſe from the unequall motion of the vernall Equinox, from which the longitude of the fixed Starres are alwaies computed.

This

This 8 Sphear is (a moſt glorious and beautifull heaven) decked and adorned with Starres of many ſorts and magnitudes, and albeit the number of Starres in this heaven are (almoſt) infinite, yet notwithſtanding there are above a thouſand of note, which the Aſtronomers take notice of, which are divided into 6 degrees of bigneſſe, each of them being greater then the Earth, as by the enſuing note appeareth.

A Star of the	1	magnitude is	68	of which there are in number	15
	2		28		45
	3	greater thē the whole globe of the Earth,	11		208
	4		1 1/2		474
	5		1		217

A Starre of the ſixth magnitude is leſſe then the Earth, and of this magnitude are 49 Starres.

This heaven is very ſlow in motion, moving (as the Ancients ſuppoſed) one degree in 100 Yeares, and accompliſhing a full revolution in 36000 yeares. But our latter Mathematicians have found out by diligent obſervations, that they move a degree in 71 yeares, and therefore accompliſh their Zodiacall Revolution in 25412 yeares

This Heaven is diſtant from the center of the Earth, as the Ancients have demonſtrated 130715000 miles, therefore the Perimeter, or circuit of this glorious heaven is 821637143 miles: So that it wheeleth about in one houre 34234881 miles, and in a minute 5705801 miles.

Moreover, the Ancient Aſtronomers being deſirous to bring the Starres in Rule and memorie of man, have reduced them into certaine Conſtellations, and given them names, that they might the better be known.

A Conſtellation, otherwiſe called an Aſteriſme, is a certaine number of Starres gathered together into one forme, repreſenting ſome living creature, or other thing, whereby they are particularly known. Of theſe Conſtellations, the number be 48, (as they are vulgarly accounted) whereof 21 be in the North, 12 in the Zodiack, and 15 in the South. The names of which Conſtellations, and number of Starres in each of them (which the Aſtronomers take notice of) are as followeth.

The Zodaicall Conſtellations are 12. viz.

Aries	14	Cancer	9	Libra	8	Capricorn	28
Taurus	22	Leo	27	Scorpio	21	Aquarius	42
Gemini	18	Virgo	26	Sagitarius	31	Piſces	34

The Northern Conſtellations are 21, viz.

Urſa minor	7	Lyra	10	Sagitta	5
Urſa major	27	Avis	17	Aquila	9
Draco	31	Caſſiopea	13	Delphinus	10
Cepheus	11	Perſeus	26	Equiſectio	4
Arctophylax	21	Heniocus	14	Pegaſus	20
Corona borealis	9	Serpentarius	24	Andromeda	23
Engonaſus	29	Serpens	18	Triangulus	4

The Southern Conſtellations are 15, viz.

Cetus	22	Procyon	2	Centaurus	37
Orion	38	Argo	41	Fera	19
Eridanus	34	Hydra	25	Ara	7
Lupus	12	Crater	7	Corona Auſt.	13
Canis major	18	Corvus	7	Piſces Auſt	11

But beſides theſe Conſtellations, there be ſome other but of late found out, and diſcovered neere the Pole Antarctique; as, *Phœnix, Grus, Indus, Niphius, Pavo, Anſer, Hydrus, Paſſer, Apis, Triquetrum, Muſca, Cameleon,* which are to be numbred. and taken notice of.

Moreover, the Stars differ one from another in colour, for ſome are bright like ſilver, ſome like gold, other ſome are ruddie, and others of a pale, leaden colour, by which their nature and quality in ſome meaſure may appear.

Of the ſeven Planets.

Of ♄. Within the concavity of this moſt glorious Heaven of the fixed Stars, is placed the Sphear and Orbe of *Saturne*, and ſo the next ſucceſſively, each Sphear containing in it but one Starre, whereof the uppermoſt, and ſloweſt in motion is *Saturne*, who is of nature cold, dry, and melancholly, and appeares as a ſtarre of the ſecond magnitude. He is eaſily known, for he twinckleth not, neither doth he ſhine much, but is of a leaden, ſwarthy, and obſcure colour; *Reſpectu ſtellarum reliquarum.* And becauſe he is *Planetarum ſupremus & altiſſimus*, he may therefore be ſometime eclipſed by the other Planets; when they are in Conjunction with him, if ſo be their latitude be equall, and of the ſame denomination; And as he may be eclipſed of the other Planets. ſo may he alſo ſometime hide and eclipſe ſome of the fixed ſtarres (that are in, or neere the Ecliptick) from our ſight. He is 22 times greater then the whole globe of the Earth, and in his meane motion is diſtant 9073000 miles, as the learned *Tycho* obſerves; but he is not alwaies of this diſtance, for he is ſometime neerer, and ſometime farther off, as all the other Planets are; (as may be ſeene by their Theoriques) when he is neereſt the Earth in Perig. he is diſtant according, to *Argol*, 10550 Semidiameters, when farthеſt off in Apog. 10592, and in his meane

meane distance 10571 semidiameters; which maketh 9091960 miles, which comes neere to noble *Tycho Brahe*. Now if so be the diameter of the Sphear of *Saturne* with *Tycho* be 18146000 miles, the circumferenece must be three times so much, and a seventh part, according to *Ramus*, *Lib.* 19. 2. Therefore making *Tycho's* observation the basis of our operation, we shall find that the perimeter of his Sphear is 57030266 miles, and that he goeth in an houre two millions, three hundred seventy six thousand two hundred sixty one miles. and in one minute, thirty nine thousand six hundred and foure miles.

Of ♃ *Jupiter* is the next Planet in order to *Saturne*, and appeares as a Starre of the first Magnitude, very bright, being of nature Warme, Moist, and Sanguine. He is found to have little or no Parallax, is which because of his vast distance from the Earth. And he may be sometime Eclipsed by the interposition of the inferiour Planets between our sight and him, and may also hide *Saturne*, or some of the fixed Starres, sometime from our sight, if so be at the time of their Conjunction the latitude be equall, which is but seldome. He finisheth his Zodiacall period in 11 years and 321 daies, and appeares (as all the other Planets do) lesse in his Apogæon, then in his Peregæon: When he is in his meane distance, he is from the Earth 3990 Semidiameters, which maketh 3431400 miles; the apparent diameter of his body is M. two three quarters and is in proportion to the Earths diameter, as 12 to 5, exceeding the Earth 14 times; he is onlightned of the Sunne, and casteth his shaddow 3243540 miles. Now if his distance from the earth be 3431400 miles, the circumference of his Sphear must necessarily be (21568800 miles) *viz.* Twenty one millions, five hundred sixty eight thousand and eight hundred miles; So that he goeth in an houre, Eight hundred ninety eight thousand, seven hundred miles; and in a minute, Fourecreene thousand, nine hundred, seventy eight miles. He finisheth his Zodiacall Period in 11 yeares, and 316 daies, his Apogæon being this yeare 1646, in the 7 degrees 27 minutes of *Libra*, according to *Keplers* Tables.

Of ♂ *Mars* (within the concavity of the Sphear of *Jupiter*) appeares in a fiery red colour, whom all Astronomers with joynt consent doe place above the Moon, *Mercurie*, *Venus*, and *Sol*. Yet *Tycho* alone contends, that when *Mars* is *Achronice*, and opposite to the Sun, he is then neerer the Earth then the Sun, and hath greater parallax. He may hide *Saturne* or *Jupiter* at some time when he is joyned with them, and may againe be hidden of *Venus*, *Mercurie*, and *Luna*. His apparent diameter is not fully two minutes wanting neere a third part; In his meane motion he is distant from the earth

1745 Semidiameters, whereby *Tycho* gathers that he is leſſe then the Earth 13 times, and leſſer then the Sunne 1820 times. When he is in Apogæon he is diſtant from the earth 2346940 miles, when he is in Perig. 657040 miles, but when he is in his mean diſtance he is 1500700 miles diſtant, therefore the perimeter or compaſſe of his Sphear is 9432971 miles, and thus much he goeth in a day naturall, ſo that he goeth in one houre 393040 miles, and in a minute 6551 miles. He finiſheth his revolution (according to his mean motion) in one yeare, and 322 dayes.

Of ☉, The Sun is placed in the middle of all the Planets, moſt cleer and bright, the fountain of pure light, he is *Fons lucis, cor Planetarum, Dux Coryphæus, & moderator reliquorum Luminum, cor, occulus, anima & mens mundi*: running his Zodaicall revolution every yeare. He hath a twofold motion, as all the other ſtars and Planets have, the firſt being moſt apparent which he finiſheth in 24 houres from Eaſt to Weſt, cauſed by the motion of the *Primum mobile*, his own proper motion is from Weſt to Eaſt, going every day 59′. 8″. according to his mean motion, ſo that he maketh his period in 365 da. 5 hou. 49′. 16″. and this is the true quantity of the Solar yeare. And as the motion of the other Planets are regular and equall, ſo is he in his courſe and motion, running equall arches in equall times, upon the ſame center, and the ſame Poles: nevertheleſſe, in this regular courſe there be three inequalities. For firſt, it is obſerved, that the Sun is longer in the ſix Northern Signs then he is in the ſix Southern, for he goeth through the ſix Northern Signs in 186 da. 18 ho. & 30′. And through the ſix Southern in 178 da. 11 ho. 30′. *fere.* The cauſe whereof will beſt appear by the ſight of the Suns Theorique. The ſecond inequality happens when the Sun is in his Apogæon, and fartheſt diſtant from the earth, for then he is ſlow in motion, and appears of a leſſe magnitude then when he is in Perigæon and nigheſt to the earth, where he ſeems greater, and his motion more ſwift. The third irregularity is, becauſe the Apogæon and Perigæon keep not always the ſame places in the Zodiaque, but is moved by little and little according to the order of the Signes. Now concerning the magnitude of the Sun, the Ancients did hold opinion that the Sun was 166 times greater then the Earth: but noble *Tycho* (the beſt Obſervator of all others) hath found that he is but 140 times greater, and that he is diſtant (in his mean motion) 989000 miles, ſo that the perimeter of his Sphear is 6216571 miles, and ſo much he moveth in a day naturall, therefore he goeth in an houre 259023 miles, and in a minute 4317 miles.

Of ♀ *Venus* is the moſt bright and ſplendent Star in the Firmament (the Luminaries excepted) and is of a great appearance, in

inſomuch that ſometimes ſhe hath been taken for a Comet. When ſhe is evening Starre, her greateſt Elongation from the Sun is never above 46 deg. 51 min. but when ſhe is morning Starre, her greateſt Elongation may be 48 deg. 9 min. The apparent diameter of *Venus* is M. 3 one third, and is leſſe then the Earth ſix times, from which ſhe is diſtant, as is the Sun and *Mercurie*, but ſhe is diſtant from the Sun 735300 miles, the greateſt extent of her ſhadow being 105 Semidiameters, *ad unguem*,. She ſuffereth Parallax, and diverſity of Aſpect as the Sun doth, if it be obſerved, yet with ſome variation, for ſhe is moved about the Sun, as about a Center, ſometimes above, ſometimes beneath, which moſt plainely and conſpicuouſly appeares by her illumination, ſeeing that ſometime ſhe is horned, ſometime meane, now halfe round, then full, and ſometime againe ſeemeth nothing in compariſon. As for her motions they are equall and regular upon their owne Centers, but they appeare very irregular to us, who live here upon the Earth.

Of ☿. Within the concavity of the Spheare of *Venus* is placed *Mercurie*, whoſe greateſt diſtance from the Sunne is never aboue 29 degrees, and therefore ſeldome ſeen. He is turned about the Sun like *Venus*, appearing ſomewhat bright & ſhining, but not very big, unleſſe he be in Perig. and of ſome pretty diſtance from the Sun. Moreover he hath the ſame appearances & Phaſes that *Venus* hath; for ſometimes he ſeemes to be horned, ſomtime half round, ſomtimes three parts enlightned, and then againe full, although it cannot be obſerved for his frequent abode under the beames of the Sun. His apparent Diameter is 2 M. and neere a halfe, and according to *Tycho*, he is leſſer then the Earth 19 times. He extendeth his ſhadow 43 Semidiameters, and is diſtant from the Sunne 585 Semidiameters. The Center of the Epicycles of *Venus* and *Mercurie* are diſtant from the Earth as is the Sun, from whom he never departs 29 degrees at moſt.

Of the ☾. The loweſt of all the Planets is the Moon, who runneth her courſe in 27 daies, 7 hou. 43 min. and 6 ſeconds. She is leſſe then the earth 39 times; ſo that according to ſome, the body of the Sun containes the body of the Moon 6540 times: herewith agreeth *Ptolomie*, *Albategnius*, *Alfraganus*, but *Copernicus* would have the Moon 43 times leſſe; So that their Diameters be as 17 to 5: with *Copernicus* it is as 7 to 2, and therefore according to his computation, the body of the Sun muſt containe the body of the Moon 7000 times. Shee is diſtant from the Earth when he is in Apog. 51600 miles; when ſhee is in Perig. and neereſt to the Earth, ſhe is diſtant 44720 miles, but in her meane motion (according to moderne obſervation) ſhe is diſtant 48760 miles. From hence therefore the perimeter of her Spheare appoares to be 306491 miles, and thus farre ſhe runneth in 24 hou.

ſo that ſhe goeth in an houre 12770 miles, and in a minute 213 miles.

The proportion of their bodies and Spheares according to Argol.

The Sun is greater then ♄ 9, ♃ 14, ♂ 2535, ♀ 1270, ☿ 3705, ☾ 10000, Earth 196 times.

Saturn is greater then ♃ 1 ½, ♂ 286, ♀ 152, ☿ 418, ☾ 1122, Earth 12 times.

Jupiter is greater then ♂ 182, ♀ 84, ☿ 266, ☾ 714, Earth 14 times.

♀ is twiſe as big as ♂, and three times as big as ☿.

♂ containeth ☿ once and a halfe.

The ☾ is greater then ♂ 13, ♀ 6, ☿ 19 times.

The diſtance of the Planets amongſt themſelves, and with the Firmament, according to the ſame Author.

The Earth is diſtant from the Firmament	4913 0720
Saturn (in his mean diſtance) is from the Firma.	127864480
Jupiter is diſtant from the Firmament	35425120
Mars is diſtant from the Firmament	47490640
The Sun is diſtant from the Firmament	44720000
The Moon is diſtant from the Firmament	48958080

All Miles.

Saturn is diſtant from ♃ 23138640, ♂ 29361440, ☉ 3193352, ☾ 36171600 Miles.

Jupiter is diſtant from ♂ 7722800, ☉ 9294880, ☾ 13532960 Miles.

Mars is diſtant from ☉ 1572080, ☾ 6310160 Miles.

The Sun is diſtant from the Moon 4238080 Miles.

Hæc incredibilia videntur tantum iis, qui Mathematicis demonſtrationibus non aſſuevernnt, &c.

The

The fifth Part:

Of the diviſion of the World, in which you may behold, the Longitude. Latitude, Rumb, and Diſtance, of moſt of the notable Cities in the World, from the City of LONDON: *Whereunto is added, diverſe Rules to make the* Ephemeris *and* Aſtronomicall Tables *in the ſecond Part (which were properly calculated for the Meridian of* London*) univerſall: with directions how to finde the diſtance of places the exacteſt way, by Trigonometry.*

CHAP. I.

Of the diviſion of the WORLD.

THe World, called by the Greeks ΚΟΣΜΟΣ, and in Latine *Mundus*, is Geographically divided into 4 Parts, *viz.* Europe, Aſia, Africa, & America.

EUROPE is bounded on the North with the Northern Ocean, and on the South with the Mediterranean Sea: on the Eaſt with the Floud *Tanais*, and on the Weſt with the Weſtern Ocean, and containeth theſe Provinces.

Germanie	*Spain*	*Swedeland*	*Hungaria*
Italy	*Denmark*	*Moſcovia*	*Sclavonia*
France	*Norway*	*Polonia*	*Grecia.*

The Principall Iſlands are theſe,

England	*Ireland*	*Candia*	*Sardigna*
Scotland	*Sicilia*	*Corſica*	*Nigropont.*

The greateſt length of this part of the World is 3000 miles, and the breadth 900.

ASIA, Is bounded on the North with the North Ocean, on the South with the Red Sea, and the Gulfs adjoyning, on the Eaſt with the Eaſt Indian Ocean, and on the Weſt with the Floud *Tanais*; whoſe principall Regions are,

Anatolia	*Armenia*	*Aſſyria*	*Perſia*	*China*
Syria	*Arabia*	*Meſopotamia*	*Parthia*	*India*, and the
Paleſtina	*Media*	*Chaldea*	*Tartaria*	Iſlands therof.

This Countrey is more famous then all the World in five reſpects. 1 For the creation of Mankinde. 2 For the birth of our Saviour. 3 For his Miracles, and place of ſuffering. 4 For the famous Monarchies of the *Babylonians*, *Aſſyrians*, *Medes*, and *Perſians*. 5 For that it is the common Mother of us all, it being the place from whence innumerrble troops of men iſſued to ſupply the vacuity of the inhabitable parts of the World.

AFRICA, Is bounded on the Eaſt with the Red Sea, on the Weſt with the Atlantique Ocean, on the South with the Southerne Ocean, and on the North with the Mediterranean Sea.

The Provinces are,

Ægypt *Barbaria* *Æthiopia* *Nubia* *Abaſmies* *Alonomotopa.*

The Iſlands.

Madagaſcar, or St. *Laurence*. St. *Thomas*. *Inſula de Cape Verde*. *Inſula de Canaria*. *Inſula de Madera*.

AMERICA, This fourth part of the World was altogether unknowne to the Ancients, but by latter obſervations is found to be bounded on the Eaſt with the Atlantique Ocean, on the Weſt with the Weſt Indian Ocean, on the North with the Northerne Ocean, and on the South with the Magellanick Sea, conſiſting of two parts, *viz. Mexicana*, and *Peruana*.

The Provinces of *Mexicana* are,

Nova Hiſpania *Terra Florida* *Nova Albion*, *vel Anglia*. *Caliſornia* *Norumbega* *Nova Francia* *Eſtotillant.*

The Provinces of *Peruana* are,

Braſilia *Tiſnada* *Caribana* *Catagena* *Peru* *Charas* *Chila* *Chicha* *Patagonos.*

The chiefe Iſlands of *Mexicana* are,

Greenland *Iſland* *Friedſland.*

The

The chiefe Ilands of *Pernana* are,

Hiſpaniola Cuba, cum multis aliis in India Occi. Inſula Margaritæ. Molucque Inſul. Remores Java major Java minor Salomonis Inſula All the other Ilands in *India Orientali.*

The names of the Seas.

Ocean Sea Narrow Sea Mediterranean Sea Mare major Mare Caſpium Eaſt Indian Sea Red Sea Perſian Sea. South Sea.

The ancient Coſmographers have alſo divided the inhabitable part of the Earth, that lyeth between the Equinoctiall and North Pole, into 7 Climates or Parallels, to which they have given names, according to the name of the place through which the middeſt of the ſaid Climes did paſſe; for they called the firſt Climate, *Diameroes*, (becauſe it paſſeth by, or through the City *Meroes*;) the ſecond Climate is called *Diaſyenes*; the third *Dia Alexandrias*; the fourth *Dia Rhodes*; the fifth *Dia Rhomes*; the ſixth *Dia Boriſthenes*; and the ſeventh *Dia Ripheos*. *Appian* and ſome of our moderne Writers adde two more, ſo that, they account in all, nine Climates; but becauſe they are of no great uſe, let this ſuffice: Onely wee have added the following Table, that you may the better underſtand what they are, which is ſo plaine, that it needeth no explanation.

A Table of the 7 Climates according to the old Accompt.

The names and numbers of the Climates.	Miles in length	Miles in bredth	Daies length in the middle of the Climate.	
1 *Dia Meroes*	20555	465	13 h	00 ′
2 *Dia Syenes*	19453	420	13	30
3 *Dia Alexandrias*	18398	370	14	00
4 *Dia Rhodes*	17299	350	14	30
5 *Dia Rhomes*	16215	270	15	00
6 *Dia Boriſthenes*	15136	225	15	30
7 *Dia Ripheos.*	14426	195	16	00

A Table shewing the Longitude, and Latitude of all the principall Cities and places in *Europe*, according to the Observations of *Tycho*, *Longomontanus*, *Kepler*, and others.

The names of the Places.	Latitu. D	M	Long. D	M	*The names of the Places.*	Latitu. D	M	Longi. D	M
Alexandria in Æg.	30	58	60	30	Leiceſter	52	42	19	42
Amſterdam	52	20	28	00	Lisborn	39	38	09	10
Antioch	37	20	70	15	Middleburg in Ze.	51	31	26	40
Antwerp in Brab.	51	12	28	00	Mount Sinai	30	00	64	00
Aquiſgrane	51	06	28	52	Marpurge	50	43	32	35
Athens	37	42	52	30	Munſter in Weſtp.	51	34	31	10
Auguſta Vindel.	48	22	35	45	Naples in Italy	40	42	38	35
Babylon,	35	00	73	00	Newarke in Eng.	53	02	20	07
Barwick	55	50	19	50	Narbone in Franc.	41	50	25	05
Brydges in Fland.	51	30	34	26	Ninive	35	50	80	30
Brunſwick	52	16	34	45	Noremberg	49	26	35	45
Brandenburg	52	30	37	20	Oxford	51	50	19	00
Calecute in India.	11	20	111	45	Prague	50	06	38	15
Carlile.	54	50	19	40	Paris	48	40	20	20
Canterbury	51	15	20	15	Padua	45	06	36	25
Cambridge	52	17	20	30	Peterburg	52	30	20	20
Calice	50	30	20	20	Rome	42	00	36	30
Conſtantinople	43	05	55	30	Quinzay	37	40	192	00
Dover	51	20	21	15	Roterdam	51	55	27	35
Dublin	54	40	12	40	Red Sea	29	50	63	30
Damaſcus	33	00	69	00	Sardes in Lydia	38	34	59	45
Edinburgh in Sc.	56	26	20	20	Salisburg	47	42	37	50
Epheſus	37	40	57	40	Stamford	52	36	20	10
Francford upõ Mæ.	50	02	32	30	Spier	49	24	33	00
Francford upõ Od.	52	20	38	45	Tubing Wittemb.	48	34	33	45
Florence	43	10	35	00	Venice	45	15	36	15
Geneva	45	25	29	50	Vienna	48	20	40	00
Hamburg	53	42	34	15	Uraniburge	55	54	36	45
Hieruſalem	32	10	70	45	Wittenburg	51	52	37	16
Lincolne	53	00	20	30	Worms	50	25	31	30
LONDON	51	32	20	00	Yorke	53	50	20	10

The use of the precedent Table.

This Table needeth no explanation, for in the first columne you have the Name of the place, in the second the Latitude, and in the third the Longitude.

EXAMPLE. *Alexandria* in *Egypt*, the Latitude is 30 degrees 58 minutes, and the longitude 60 degrees 30 minutes, and so the rest in their order.

A Table shewing the Bearing, Distance, Longest day, and difference of Meridians, of some of the principall Places in the World from the City of *London*.

The names of the Places.	The way they beare.	their distance in M.	Longest Day. H	M	Difference of Meridians. H	M	
Amsterdam	E by N	266	16	40	0	28	a
Athens	S E by E	1624	14	40	0	56	a
Alexandria in Ægypt	S E by E	2169	14	00	2	42	a
Antwerp	East ferè	248	16	28	0	24	a
Argile	South	872	14	35	0	10	a
Antioch where S. *Luke* dwelt.	E S E	2319	14	26	3	16	a
Alca in Media	E by S	2791	15	00	4	25	a
Asia a City in Sasana	E S E	2923	14	08	4	01	a
Axima in Persia	E S E	3108	14	15	4	31	a
Arges in Carmania	E S E	3917	13	25	5	06	a
Aspabora in Scythia	E by S	3311	15	20	5	28	a
Asta in Drangiana	E S E	4087	14	00	5	50	a
Barwick	North ferè	267	17	24	0	02	a
Bayone in Galaza	S W by S	800	15	08	0	55	s
Bilbow in Biskay	S S W	578	15	30	0	33	s
Babylon	E S E	2724	14	25	3	56	a
Burdeaux in France	South ferè	360	15	25	0	08	s
Brydges in Flanders	East	162	16	16	0	16	a
Bola in Armenia magna	E by S	2294	15	20	3	45	a
Barut	E S E	2321	14	15	3	08	a
Bethsaida	S E by E	2309	14	06	2	29	a
Bardaxima in India	E S E	4735	13	15	6	15	a
Barnia	W by S	8824	12	20	11	52	s
Baculajus in America	Westerly	2200	16	58	3	59	s
Carlile	N N W	224	17	00	0	09	s
Carnes Point in Scot.	North	628	19	25	0	00	

The names of the Places.	The way they beare.	their distance in M.	Longest Day. H	Longest Day. M	Difference of Meridians. H	Difference of Meridians. M	
Civill in Andelazia	S by W	950	14	40	0	52	S
Calice in France	E by S	86	16	25	0	9	A
Cleve	East	303	16	30	0	32	A
Colline	E by N	360	16	34	0	39	A
Constantinople	E S E	1547	15	15	2	24	A
Cape Devard	S S W	2426	12	50	1	10	S
S. Cruce Rode	S S W	1440	14	0	1	0	S
Canarie Island	S S W	1914	13	25	1	20	S
Claudiapolis	E S E	1697	15	8	2	38	A
Cæsaria in Capadocia	E S E	2064	14	50	3	6	A
Charon in Mesopotamia	E S E	2466	14	30	3	36	A
Cuni in Egrosia	E S E	4469	13	30	6	0	A
Calicute in India	S E by E	5214	12	20	0	8	A
Ciamfa	E by S	7205	14	36	11	43	A
Cyamba	E by S	7980	13	36	11	48	A
Cappecrusos	S S W	3792	12	30	2	20	S
Cappe de Plando	S W by W	4547	12	20	4	56	S
Cappe S. Martha	W S W	5103	12	45	6	24	S
Carthagena	W S W	5316	12	38	6	32	S
Cicilia Island	S E by S	1178	14	30	1	8	A
Corsica Island	S E by S	829	14	50	0	44	A
Candy Island	S E by S	1791	15	25	2	20	A
Cyclades Island	E S E	1545	14	35	2	24	A
Cyprus Island	E S E	2190	14	20	3	2	A
Dover	E by S	49	16	25	0	5	A
Dublin in Ireland	N W by W	296	17	15	0	29	S
Dantzick	E N E	961	17	5	1	44	A
Demine Castle	South ferè	2940	12	20	0	20	A
Damascus	E S E	2404	14	15	3	16	A
Edinburgh in Scotland	North	328	17	40	0	0	
Elson Nore in Denmark	N E	577	18	0	0	50	A
Ephesus	E S E	1808	14	40	2	30	A
Erupa in Arabia	S E	1641	13	56	3	30	A
Francford	East ferè	448	16	15	0	47	A
Florence	S E	802	15	10	0	57	A
Fesse	S S W	1365	14	0	0	39	S
Gibaraltarre	S by W	1066	14	25	0	49	S
Granmaliga	S by W	960	14	4	0	35	S
Granado	S by W	911	14	43	0	45	S
Geldia	East ferè	2458	15	40	8	12	A

The names of the Places.	The way they beare.	their distance in M.	Longest Day. H	Longest Day. M	Difference of Meridians. H	Difference of Meridians. M
Geiten in China	E by S	7312	13	35	11	12 s
Gube Island	W S W	5114	13	26	5	0 s
Hamburgh	E N E	538	18	0	0	56 a
Heratompilon	E by S	3724	14	38	5	6 a
Hatcam	E by S	3332	14	50	5	14 a
Hispaniola Island	W S W	4805	13	15	6	20 s
Iseland	N N W	930	21	44	0	52 s
Jerusalem	S E by E	2352	14	8	3	3 a
Issedan in Scythia	East ferè	5008	15	56	8	40 a
Isadon in Serica	East ferè	5612	15	30	9	28 a
Island of Japan	E by S	7919	14	10	11	52 a
Island of Jamica	W S W	5332	13	6	6	59 s
St. Johns Island	W S W	4536	13	8	5	46 s
Lisbone in Portugall	S S W	985	14	45	1	0 s
Lucke	East	333	16	0	0	30 a
Lake of Sodome	S E by E	2404	14	4	3	8 a
Lace	E by S	7047	13	24	9	44 a
Land of Labrador	W N W	2768	20	0	3	25 s
The Isle of Man	N N W	358	17	30	0	20 s
Middleburg	East	205	16	30	0	20 a
Mentz in Germanie	East	420	16	25	0	45 a
Millain	S E ferè	645	15	22	0	48 a
Muscovia in Rosey	E by N	1747	17	40	3	16 a
Moroco in Barbary	S S W	1449	14	0	0	59 s
Madera Islands	S W by S	1625	13	54	1	25 s
Malaqua	S E by E	8781	12	56	11	16 s
Mexico	W by S	6344	13	20	9	28 s
Majorica Island	South ferè	792	14	43	0	12 s
Minorica Island	South	752	14	45	0	0
Naples	S E by E	1051	14	50	1	16 a
Nice	E S E	1668	15	5	2	32 a
Nicopolis in Armenia	E S E	2129	15	3	3	18 a
Ninive	E S E	2635	14	30	3	52 a
Nar in Moabar	S E ferè	8512	13	15	11	44 a
Nigropont Island	E S E	1643	14	40	2	16 a
Olympus	E S E	1993	14	30	2	46 a
Olbia	E S E	1985	14	36	2	48 a
Oxford	N W	47	16	28	0	5 s
Ormosa Island	E S E	4070	13	12	5	4 a
Sr. Patricks Purgatory	N W by W	415	17	4	0	45 s

The names of the Places.	The way they beare.	their distance in M.	Longest Day. H	M	Difference of Meridians. H	M	
Paris in France	S S E	215	15	57	0	13	s
Prague in Bohemia	East ferè	700	16	15	1	14	a
Pla	S E	741	15	6	0	53	a
Philippos in Macedonia	E S E	1395	15	10	2	3	a
Philadelphia	E S E	1816	14	44	2	36	a
Pompejopolis in Galatia	E S E	1814	15	10	2	48	a
Pergamus	E S E	1709	14	54	2	30	a
Port Sasla or Joppa	S E by E	2338	14	6	3	2	a
Prepsa	E S E	4389	15	30	7	20	a
Polibotra	E by S	5710	13	45	8	12	a
Pentapolis in India	E S E	6337	13	10	8	40	a
Pera in America	S W by W	5528	12	20	6	0	s
Pannama	S W by W	5794	12	15	6	56	s
Quinzay	E by S	7272	13	35	11	28	a
Rome	S E by E	887	15	4	1	7	a
Red sea	S E by E	2336	13	56	2	54	a
St. Sebastians in Biskay	S by W	752	15	30	0	18	s
Spiers	E by S	430	16	2	0	46	a
Strawsborow	E by S	432	16	0	0	41	a
Sena in Margiane	E by S	3430	15	8	5	30	a
Sardinia Insula	S S E	932	14	40	0	44	a
Stipango Island	West	6668	16	4	11	58	s
St. Johns Island	W S W	4536	13	8	5	46	s
Tolledo in Spain	S by W	934	14	36	0	36	s
Troy	E S E	1605	15	0	2	24	a
Thomara in Bactriana	E by S	3635	14	50	5	43	a
Thomara in India	E S E	7680	12	20	9	52	a
Tangury	E S E	6980	14	5	10	28	a
Thebet	E S E	7670	12	10	9	44	a
Tumbes	S W by W	6045	12	15	6	56	a
Venice	E S E	744	15	28	1	3	a
Yorke	North	150	17	0	0	0	
Cambridge	N by E	44	16	32	0	2	s
Stanfordia	North	70	16	38	0	0	
Belvoir Castle	North	84	16	41	0	0	
LONDON.			16	26	0	0	

In

In regard it is a thing deſired of many, to hear, read, and diſcourſe, of Cities, and places far remote, therefore, for their ſatisfaction, and the inſtruction of others, have we compiled the former Tables, which ſheweth the bearing and diſtance, longitude and latitude of all the principal Cities and places in the World, from the City of *London*, as likewiſe their longeſt day, and difference of Meridians, whereby the precedent *Ephemeris*, and Aſtronomical Tables, (which are peculiarly calculated for the Meridian of *London*) may be made univerſal through the whole World, as by the following may appear.

The uſe of the fore-going Table is very eaſie, for ſeek the place you deſire in the firſt column, and towards the right hand (under their proper Titles) you may find their bearing, diſtance, and longeſt day, and alſo the difference of the Meridians in hours and minutes, denoting the time that the Moon doth change before, or after it doth at *London*; and whereſoever you find the letter (a) it denotes that the hours and minutes there found, are to be added to the hours and minutes of the new and full Moon found in the *Ephemeris*, that you may have the true time of the Lunation in the ſaid place. But contrariwiſe if you find the letter (s) annexed thereunto, you muſt make ſubſtraction, and the true time will appear. We will illuſtrate this by ſeveral Examples.

1 It is required to know the bearing, diſtance, longeſt day, and difference of Meridians of the City of *Jeruſalem* from *London*, Therefore (according to the Alphabet) I find *Jeruſalem*, againſt which (in the ſecond column) I find it bears ☉ ☾ by ☾, (in the third) that it is diſtant from *London* 2352 miles; (in the fourth) that their longeſt day is 14 hours 8 minutes; and (in the laſt column) that the Moon changeth 3 hours 3 minutes after it doth at *London*, as the letter (a) denotes. In like manner proceed with any other place.

2 By *Chap.* 2. of the ſecond Part, you may find that the Moon changeth at *London*, *March* 14, 1648 at $6^h. 44'$ before noon, now if you would know at what hour the Moon doth change at *Conſtantinople*, you may by the firſt Propoſition find that the difference of Meridians between *London* and *Conſtantinople* is $2^h. 44'$ s, wherefore if you adde $2^h. 44'$ (the difference of Meridians) to $6^h, 44'$, (the time of the Moons change at *London*) the ſumme will be $9^h, 28'$, at which time the Moon changeth at *Conſtantinople*, the ſame 14 of *March*, 1648.

3 By having the hour of the day at *London*, the hour of the day may be found in moſt places in the World, by Adding or Subſtracting the difference of Meridians, as the Letters (a) and (s) denote.

4 If you would calculate the true place of the Sun or Moon for any place mentioned in this Table, you must first know the difference of Meridians, and adde it to, or substract it from the time at *London*; Imagine that on *April*, 10, 1649 at noon, it were desired to find the Suns true place at *Rome*, the difference of Meridians is $1^h 57'$ after, wherefore in this case you must substract $1^h, 7'$, from the time given, and the time will be $10^h, 53'$, *ante Merid.* at which time the Suns true place will be found to be $1^s, 0^d, 44', 42''$.

Chap. II.

To find the Longitude of any City, Province, or place, by the Moons Eclipse.

WE might here shew you many ways to find the Longitude of any *City*, *Country*, or *Place*, but because they are unapt for the Volume, and not for every mans capacity, we shall not mention them; onely in this place shew you briefly how to know the same by the Eclipse of the Moon, which *Gemma Frisius* thinketh to be the most exact and absolute of all other. Briefly thus.

Observe the beginning of the Eclipse in that place, whose Longitude is unknown; which if it shall agree in hours and minutes with the time of the beginning of the Eclipse in *Page* 48. 49. and 50. of this Book, you may be ascertain'd, that that place is under the Meridian of *London*, whose longitude is about 20 degrees. But if so be the beginning of the Eclipse differ, then be sure the Meridian and Longitude of that place differs from the Meridian of *London*, which you may thus find: Substract the lesser number of the hours and minutes, of the beginning of the Eclipse from the greater, and the difference convert into degrees and minutes after this manner; Take for every hour 15 degrees, for 4 minutes one degree, and for every minute of an hour 15 minutes of a degree, and the number of degrees and minutes so found, adde to the degrees & minutes of the Longitude of the Meridian of *London*, if it be more Oriental (that is, if the number of hours shall be found greater in the same) substract, if it be more Occidental, (that is, if the number of hours there be found to be lesse) and you shall have the Longitude of the said City, which before was unknown.

Chap.

CHAP. III.

How to find the diſtance of any two places upon the Earth, howſoever ſcituated, by Trigonometricall *Calculation.*

THough there be diverſe waies to finde the diſtance of places, *viz.* by the Globe, by Maps, Geometrically, &c. Yet the moſt exact of all other is by *Trigonometrie*, which way we will here lay downe in three Propoſitions.

Propo. I. *Two places differing onely in the Latitude, to finde their diſtance.*

In this Propoſition there are two varieties, *viz.*

1 If the two places propounded lye under one and the ſame Meridian, and both of them on one ſide of the Æquinoctiall; you muſt ſubſtract the leſſer Latitude from the greater, and the remainder converted into miles (by allowing 60 miles to a degree) will be the diſtance required.

EXAMPLE. *Vicentia* and *Auguſta* lye under one and the ſame Meridian, and both on the North ſide of the Æquinoctiall; *Vicentia* having 44^d, $55'$ latitude, and *Auguſta* 47^d, $42'$ latitude, the difference of latitude is 2^d, $47'$, which converted into miles by multiplying it by 60, and adding thereto the odde minutes, maketh 167 miles, and that is their diſtance.

2 If one place lye on the North, and the other on the South ſide of the Æquinoctiall (yet both under the ſame Meridian) you muſt then adde both the Latitudes together, and the ſumme converted into miles will give their diſtance.

Propo. II. *Two places differing onely in Longitude, being given, to finde their diſtance.*

In this Propoſition alſo there are two varieties.

1 If the two places propounded lye under the Æquinoctiall, then the difference of their Longitudes reduced into miles (allowing 60 miles to a degree) giveth the diſtance of the places required.

EXAMPLE. It is required to know the diſtance of the Iſland *Samatra* from the Iſland S. *Thoma*, (both lying under the Æquinoctiall) the Iſland *Samatra*, hath long. 137^d, $10'$, and the Iſland of St. *Thoma* hath long. 33^d, $10'$; therefore the difference of their Longitude is 104^d, which multiplyed by 60 maketh 6240 miles, which is the diſtance of the ſaid places.

2 But if the two places propounded differ onely in Longitude, and

and lye not under the Æquinoctiall, but under ſome other intermediate parallel between the Æquinoctiall and one of the Poles, then to finde their diſtance, the proportion will be,

As the Radius, or 90 deg. is to the Co-ſine of the common Latitude;

So is the Sine of halfe the difference of Longitude to the Sine of halfe their diſtance.

EXAMPLE. The Cities of *Compoſtella* and *Conſtantinople* have both one Latitude, *viz.* 43 deg: 0 min: but differ in Longitude 43 degrees, 15 minutes. The complement of their Latitude is 47 degrees, and the halfe Longitude is 21 deg. 37 min. 30 ſeconds; therefore the operation is thus to be framed.

		10,
The Radius or Sine of 90 deg.		
the Co-ſine of the common Latitude	47^d	9,8641
The Sine of the halfe difference of Longitude	$21^d, 37', 30''$.	9,5664
The Sine of halfe their diſtance		9,43053

whoſe arch $15^d, 38'$, being doubled, giveth $31^d, 16'$, which converted into miles (as before is taught) giveth 187^6, which is the diſtance between the two places required.

Prop. III. *Two places being given, which differ both in Longitude and Latitude, to finde their diſtance.*

In this Propoſition is contained three varieties.

1 If one place be under the Æquinoctiall Circle, and the other towards either Pole, then the proportion is,

As the Radius or Sine of 90 degrees

Is to the Co-ſine of the difference of Longitude:

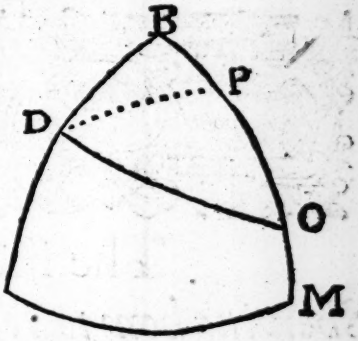
So is the Co-ſine of the Latitude given,

To the Co-ſine of their diſtance required.

EXAMPLE. If it were required to find the diſtance of the Iſland of St. *Thoma* (which lyeth directly under the Æquinoctiall, and hath Longitude 38 deg.) and the City of *London* (which hath 51^d 30′ Latitude, and 20^d Longitude) their diſtance will be found to be 3222 miles.

2 If both the places propounded be without the Æquinoctiall, and on the Northern or Southern ſide thereof, then the proportion muſt be wrought at two operations, and becauſe there is ſome difficulty therein, we have added the following figure, which will make it perſpicuous to the meaneſt capacitie.

Let



Let D repreſent *London*, whoſe latitude is F D 51 deg. 30 min. and longitude 20 degrees no minutes, and let O repreſent *Jeruſalem*, whoſe latitude M O is 31 deg. 46 min. and longitude 66 deg. which being known, you have given (1) the ſide B D, the complement of the latitude of *London*, 38 deg. 30 min. (2) the ſide B O, the complement of the latitude of *Jeruſalem*, 58 degrees, 20 min. (3) the angle D B O (whoſe meaſure is F M) the difference of longitude 46 deg. no min. and it is required to finde the ſide D B. Therefore the proportion is

1 As the Radius B M 90 degrees,	10,0000000
To the Co-ſine of D B O 44 deg.	9,8417712
So is the Tangent of D B 38 deg. 30′	9,9006052
To the Tangent of B P 28 deg. 55′	9,7423764

Which being ſubſtracted from B O 58 deg. 20 min. there remaineth O P, 29 deg. 25 min. then ſay,

2 As the Co-ſine of B P 61 deg. 5 min.	9,9421688
To the Co-ſine of P O 60 deg. 35′	9,9400535
So is the Co-ſine of D B 51 deg. 30′	9,8935443
	19,8335978
To the Co-ſine of D O 51 deg. 9′	9,8914290

whoſe complement is 38 deg. 5′, which converted into miles as before is taught, *fecit* 2331 miles and ſuch is the diſtance required.

3 If the two places propounded differ both in Longitude and Latitude and be both of them without the Equinoctiall, and one of them towards the North and the other towards the South Pole, then the proportion is;

1 As the Radius is to the Co-ſine of the difference of Longitude, So is the co-tang. of one of the Latitudes, to the Tang. of another ark, Which being ſubſtracted out of the other Latitude, and 90 deg. added thereto, Say

2 As the co-ſine of the ark foũd, is to the co-ſine of the ark remaining So is the coſine of the latitude firſt taken, to the coſine of the diſtãce.

Theſe are all the varieties that can poſſibly happen in any propoſition concerning the diſtance of places, and is the exacteſt way that can be invented, provided the Longitude and Latitude be truly given.

The

The sixth Part:

Shewing how to resolve most Propositions in Astronomy, by Trigonometry. Also Astronomical Tables of the Altitude, Azimuth, Amplitude, and Declination of the Sun and Stars: with rules to finde the houre of the day in severall Latitudes, &c. Also Tables shewing the right Ascension, Declination, Longitude, Latitude, and Semidiurnall Arch of the Sun and fixed Stars.

Chap. I.

To finde the Suns Declination at any time.

THe Declination of the Sun is his distance from the Equinoctiall point either Northward or Southward, and is greatest when he is in the beginning of *Cancer* or *Capricorn*, being 23 deg. 31′. therefore that you may speedily find the declination of any other point, the Trigonometricall proportion is,

As the Sine of 90 degrees,
Is to the Sine of the Suns greatest declination
So is the Sine of his distance from the next Equinoctiall point,
To his present Declination.

So the Sun being in the tenth degree of ♈, his declination will be found to be 3 deg. 59′ *ferè*.

But because the Canon of Logarithmes are not always at hand, we have here inserted a Table of the ☉ declination, for every degree of the Ecliptick, which by the precedent operation may be continued to every minute.

A Table of the Suns Declination for every Degree of the Ecliptique.

Degr.	♈ ♎ D	′	″	♉ ♍ D	′	″	♊ ♐ D	′	″	Degr.
1	0	23	57	11	51	48	20	25	57	29
2	0	47	53	12	12	41	20	38	59	28
3	1	11	49	12	33	21	20	49	9	27
4	1	35	44	12	53	50	21	1	15	26
5	1	59	37	13	13	5	21	12	28	25
6	2	23	28	13	34	8	21	23	8	24
7	2	47	18	13	53	57	21	43	23	23
8	3	11	4	14	13	32	21	43	15	22
9	3	34	48	14	32	52	21	52	43	21
10	3	58	28	14	51	59	22	1	45	20
11	4	22	55	15	10	51	22	10	22	19
12	4	45	37	15	29	27	22	18	35	18
13	5	9	5	15	47	47	22	26	22	17
14	5	32	29	16	5	52	22	33	44	16
15	5	55	47	16	23	38	22	40	40	15
16	6	18	59	16	41	9	22	47	10	14
17	6	42	6	16	58	22	22	53	14	13
18	7	5	6	17	15	18	22	58	52	12
19	7	28	0	17	31	56	23	4	3	11
20	7	50	7	17	48	15	23	8	48	10
21	8	13	36	18	4	10	23	13	6	9
22	8	35	38	18	19	48	23	16	57	8
23	8	58	21	18	35	20	23	20	21	7
24	9	20	36	18	50	22	23	33	18	6
25	9	42	42	19	5	5	23	25	48	5
26	10	4	38	19	19	26	23	27	51	4
27	10	26	25	19	33	27	23	29	27	3
28	10	48	2	19	47	7	23	30	35	2
29	11	9	28	19	59	59	23	31	16	1
30	11	30	44	20	13	21	23	31	30	0
Degr.	D	′	″	D	′	″	D	′	″	Degr.
	♍ ♓			♌ ♒			♋ ♑			

The use of the Table

The Table consisteth of 5 columnes, the first and last contain the degrees of the Signes which rare placed in the head or foot thereof, so that if you finde the Signe that the Sun is in at the head or foot of the Table, & the Degrees in the first or last columne thereof, then in the common angle you shall have the declination of the Sun answering thereto.

EXAMPLE. The Sun being in the 10th. degree of ♉, and you would know his Declination, you must finde ♉ in the head of the Table, and 10 degrees in the first columne, then guide your eye down from ♉ till you come against 10 degrees, and there you shall finde, 14d. 51′. 59″. which is the Suns declination when hee is in the 10th. degree of ♉.

Note, That if you finde the Signe in the foot of the Table, you must finde the degrees in the last columne.

The uſe of this excellent Table may appeare by the ſubſequent Propoſitions, it being generally one of the three termes given in moſt Solar Aſtronomicall Propoſitions. For

The Latitude of the place and declination of the Sunne being given, you may find, 1 His riſing or ſetting.

As the Co-tangent of the Latitude, to the tangent of the ☉ declin.
So is the Radius, to the Sine of the Aſſentionall difference between the houre of 6, and the Sun riſing or ſetting.

2 His Amplitude.

As the Co-ſine of the Latitude, is to the Radius;
So is the Sine of the Declination, to the Sine of the Amplitude.

3 At what time he commeth to be due Eaſt or Weſt.

As the Tang: of the Latitude, is to the Tang: of the Declination;
So is the Radius, to the Co-ſine of the houre from the Meridian.

4 What altitude the Sun ſhall have when he commeth to the Eaſt or Weſt.

As the Sine of the Latitude, to the Sine of the Declination;
So is the Radius to the Sine of the Altitude.

5 What Azimuth the Sun ſhall have at the houre of ſix.

As the Co-ſine of the Latitude, is to the Radius;
So the Co-tangent of ☉ Declination, to the Tangent of the Azimuth from the North part of the Meridian.

6 His right Aſſenſion.

As the Tang: of his greateſt Declination, is to the Radius;
So is the Tangent of his preſent Declination,
to the Sine of his right Aſſenſion.

7 The Latitude of the place, Declination of ☉, and the Alititude of the ☉ being given, to finde his Azimuth.

Conſider whether the Suns Declination be Northward or Southward, ſo may you find his diſtance from the Pole, then adde this diſtance, the complement of his altitude, and the complement of your latitude into one Summe, and from halfe that Summe, ſubſtract the ☉ diſtance from the Pole, and note the difference, then ſay,

1 As the Radius, is to the Co-ſine of the Altitude;
So is the Coſine of the Latitude, to a fourth Sine.

2 As this fourth Sine is, to the Sine of the halfe Summe;
So is the Sine of the Difference, to a ſeventh Sine.

Unto which ſeventh Sine if you adde 90 degrees, half that Summe will be the Sine of an Arke, whoſe complement being doubled is the Azimuth you looke for.

Having thus laid the foundation by giving you the proportions of all the moſt neceſſary propoſitions in Aſtonomy, we will here inſert diverſe Tables exactly calculated by the former Doctrine, whoſe uſe and excellency will appeare.

CHAP.

CHAP. II.

Of the Artificial day and how to find the length of the ſame, with the time of the Suns riſing and ſetting.

THE Artificiall day is an arch of the naturall day, and containes that ſpace of time, which is numbred from the riſing of the Sun, unto the going down of the ſame, and is equall or unequall. The mean or equall artificiall day contains alwayes 12 houres, which evermore happens when the Sun is in the Equinoctiall, but when the Sun is out of the ſame line, it is unequall, and is then either longer, or ſhorter then 12 houres, according to the Suns Arch and parallell cauſed by the greater or leſſer elevation of the Pole above the Horizon.

Now that the length of the Artificiall day and night may be found ſpeedily, we have ſet down a Table, of the quantity of dayes and nights for every degree of the elevation of the Pole, from 45 deg. to 56 deg. whereby may be found their true magnitude and quantity for every day in the yeare, the place of the Sun, and elevation of the Pole being given. In the Northerne Signes is placed the Semidiurnall arch (or halfe length of the day:) In the Southerne Signes the Seminocturnall, or halfe length of the night, in this order. When the Sun is in ♈ ♉ ♊ ♋ ♌ ♍ you have againſt the ſame the Semidiurnall arch, but when in ♎ ♏ ♐ ♑ ♒ ♓ you have the Seminocturnall: Therefore finde the place of the Sun on the ſide of the Table (either on the right hand or on the left) and the elevation of the Pole on the head, and in the common Area or place of meeting you ſhall have either the Semidiurnall or Seminocturnall arch according to the Signe you tooke.

1 EXAMPLE. *When the Sun is in a Northerne Signe.*

Admit the Sun be in the firſt point of ♊ *Gemini*, and it is required to know the length of the day where the Pole is. Elevated 52 deg. Firſt therefore find the place of the Sun in the firſt columne, and the elevation of the Pole on the head, and in the place of meeting is 7 hour. 52 min. which is the Semidiurnall arch, or halfe length of the day, and this arch being doubled maketh 15 hour. 44 min. the length of the day.

2 EXAMPLE, *when the Sun is in the Southern Signes.*

When the Sun is in the 12 deg. of ♒ *Aquarius*. I deſire to know the length of the day and night, and at what time the Sun riſeth and ſets in the ſaid latitude of 52 deg. Firſt ſeeke the Suns place, being ♒ 12 which find on the right hand of the Table, then ſeek the elevation of the Pole 52 deg. and ſo deſcend downwards till you come againſt

the ☉ place, & there you shall find 7 hour. 34 min. and because the ☉ is in a Southerne signe, therefore conclude the same to be the Semi-nocturnall arch, or halfe length of the night. and therefore the length of the whole night is 15 hour. 8 min. which taken out of 24, there remaineth 8 hour. 52 min. the length of the day, and this bisected giveth the time of the Sun setting. *viz:* at 4 hour. and 26 min.

The Elevation of the Pole.

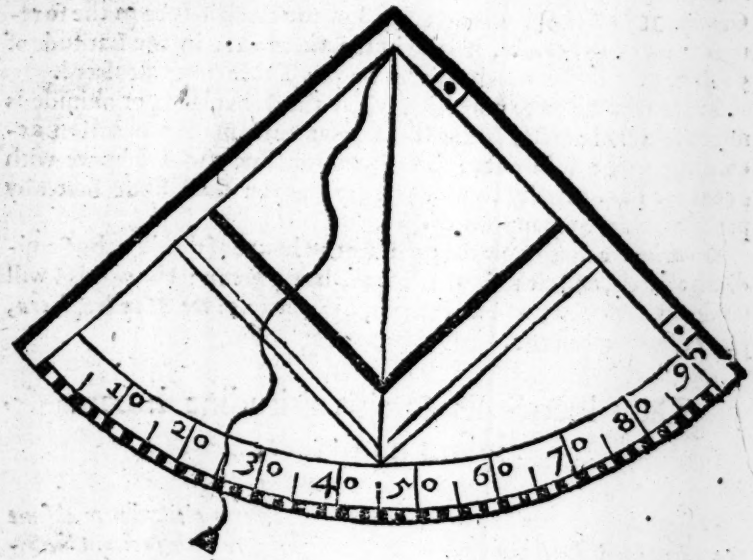
The place of the Sunne.	45	46	47	48	49	50	51	52	53	34	55	56	The place of the Sunne.
	h. m	h. m	h. m	h. m	h. m	h. m	h. m	h. m	h. m	h. m	h. m	h. m	
♈ 0♑	6 0	6 0	6 0	6 0	6 0	6 0	6 0	6 0	6 0	6 0	6 0	6 0	♎ 0♈
3	6 5	6 5	6 5	6 6	6 6	6 6	6 6	6 6	6 6	6 7	6 7	6 7	27
6	6 10	6 10	6 10	6 11	6 11	6 11	6 12	6 12	6 13	6 13	6 14	6 14	24
9	6 14	6 15	6 15	6 16	6 16	6 17	6 18	6 18	6 19	6 20	6 20	6 21	21
12	6 19	6 20	6 20	6 21	6 22	6 23	6 24	6 24	6 25	6 26	6 27	6 28	18
15	6 24	6 25	6 26	6 26	6 27	6 28	6 29	6 31	6 32	6 33	6 34	6 35	15
18	6 29	6 30	6 31	6 32	6 33	6 34	6 35	6 37	6 38	6 39	6 41	6 42	12
21	6 33	6 34	6 36	6 37	6 38	6 40	6 41	6 43	6 44	6 46	6 48	6 49	9
24	6 38	6 39	6 41	6 42	6 44	6 45	6 47	6 49	6 50	6 52	6 54	6 56	6
27	6 43	6 44	6 46	6 47	6 49	6 51	6 53	6 55	6 57	6 59	7 1	7 3	3
♉ 0♋	6 47	6 49	6 50	6 52	6 54	6 56	6 58	7 0	7 3	7 5	7 8	7 10	♍ 0♓
3	6 51	6 53	6 55	6 57	6 59	7 1	7 4	7 6	7 9	7 11	7 14	7 17	27
6	6 56	6 57	7 0	7 2	7 4	7 7	7 9	7 12	7 15	7 17	7 21	7 24	24
9	7 0	7 2	7 5	7 7	7 9	7 12	7 15	7 17	7 20	7 24	7 27	7 30	21
12	7 4	7 7	7 9	7 12	7 15	7 17	7 20	7 23	7 26	7 30	7 33	7 37	18
15	7 9	7 11	7 13	7 17	7 19	7 22	7 25	7 28	7 32	7 35	7 39	7 43	15
18	7 12	7 15	7 18	7 21	7 24	7 27	7 30	7 34	7 37	7 41	7 45	7 49	12
21	7 16	7 19	7 22	7 25	7 28	7 31	7 35	7 39	7 42	7 47	7 51	7 56	9
24	7 20	7 23	7 26	7 29	7 32	7 36	7 39	7 43	7 48	7 52	7 56	8	6
27	7 23	7 26	7 29	7 33	7 36	7 40	7 44	7 48	7 52	7 57	8 2	8 7	3
♊ 0♌	7 26	7 30	7 33	7 36	7 40	7 44	7 48	7 52	7 57	8 2	8 7	8 12	♏ 0♒
3	7 29	7 33	7 36	7 40	7 44	7 48	7 52	7 56	8 1	8 6	8 12	8 17	27
6	7 32	7 36	7 39	7 43	7 47	7 51	7 56	8 0	8 5	8 10	8 16	8 22	24
9	7 35	7 38	7 42	7 46	7 50	7 54	7 59	8 4	8 9	8 14	8 20	8 26	21
12	7 37	7 40	7 44	7 48	7 53	7 57	8 2	8 7	8 12	8 17	8 23	8 30	18
15	7 39	7 42	7 46	7 50	7 55	7 59	8 4	8 9	8 15	8 20	8 26	8 33	15
18	7 40	7 44	7 48	7 52	7 57	8 1	8 7	8 11	8 17	8 23	8 29	8 36	12
21	7 41	7 45	7 49	7 54	7 58	8 3	8 8	8 13	8 19	8 25	8 31	8 38	9
24	7 42	7 46	7 50	7 55	7 59	8 4	8 9	8 14	8 20	8 26	8 32	8 39	6
27	7 43	7 47	7 51	7 56	8 0	8 4	8 10	8 15	8 21	8 27	8 33	8 40	3
♋ 0♍	7 43	7 47	7 51	7 56	8 0	8 5	8 10	8 15	8 22	8 27	8 34	8 41	♐ 0♍

CHAP.

CHAP. III.

How to find the Altitude of the Sun.

FIrſt, you muſt provide a Quadrant of Braſſe, or Box, whoſe Semidiameter may containe, for conveniencies ſake 8 or 10 Inches, or more, or leſſe, as you pleaſe; then muſt you divide the Limbe thereof into 90 equall parts, or degrees, and ſubdivided into as many parts as quantity will permit; which being done, place two ſights upon the upper edge, and a thread and plummet, on the Centre, ſo that the plummet may have free libertie to move about the Limbe, as by the Figure following may appeare.



The Quadrant thus fitted and prepared for uſe, you muſt then liſt up the ſame handſomely towards the Sunne, moving it up and downe, untill the Sunne beames pierce directly through the Sights, (the thread and plummet having free liberty) ſo will the thread ſhew you upon the Limbe the true altitude of the Sunne above the Horizon.

And becauſe the day houre may ſpeedily be obtained, by helpe of the foreſaid Inſtrument, we have calculated the following Tables, according to the doctrine of Sphæricall Triangles, whereby the Sunnes altitude may with ſpeed be known at all times, and thereby the houre of the day, as by the Example following may appeare.

CHAP.

Chap. IV.

The use of the following Tables.

ADmit when the Sun is in the first point of ♊ *Gemini* or ♌ *Leo* you finde the height of the Sun taken by the Quadrant to be 34 deg. 2 min. and would then know what a clock it is at that moment: therefore seek in the Table and in the Row, that directly answereth ♊ and ♌, you shall finde that 34 deg. 2 min. is agreeable to 8 or 4 of the clock in the head of the Table; Therefore I pronounce, that when the Sun is 34 deg. 2 min. in height when he enters *Gemini* ♊ or *Leo* ♌, it is precisely 8 of the clock if it be in the forenoon or 4 of the clock, if it be in the afternoon, in the Latitude of 52 deg. 30 min. for which Scituation this Table was calculated.

Moreover it is to be noted that when the Suns place, or altitude is not to be found exactly in the Table, you must make proportion according to the difference, so shall you obtaine the day houre with great facility, celerity, and dexterity; as you shall finde better by practice, then by many words.

Orontius teacheth how to supputate the houre of the day, the Semidiurnall arch, and altitude of the Sun, being given: His words I will set down *verbatim*, as I finde them, *Lib.4. cap.5. De Mundi Sphæra, sive Cosmographia, &c.*

Data loco Solis & ejus altitudine horam ipsam numerare.

Si juvet autem per locum Solis cognitum, & ejus altitudinem absque præcedenti vel simili tabula, horam ipsam colligere: Sic facito. Due Sinum rectum inventæ, vel, datæ Solaris altitudinis, in Sinum rectum arcus Semidiurni ipsius Solis, & productum divide per Sinum rectum altitudinis Meridianæ ejusdem Solis: fiet enim Sinus rectus cujus arcus in respondentes temporis partes conversus, quæsitam indicabit horam, sed ab ortu Solis numerandam, si datum tempus fuerit ante Meridiem; vel ab ipsius Solis occasu, ubi præfatum tempus pomeridianum extiterit.

A

A Table of the Suns Altitude for every houre, *for the Latitude of* 50 *degrees.*

Before noon		12		11		10		9		8		7		6		5		4	
After noon.				1		2		3		4		5		6		7		8	
S	D	S	D	D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M
♊	30	♋	0	63	30	61	1	54	39	46	13	36	52	27	14	17	46	8	46	0	35
♊	20	♋	10	63	7	60	39	54	20	45	56	36	35	26	58	17	29	8	28	0	16
♊	10	♋	20	62	00	59	36	53	24	45	5	35	47	26	9	16	39	7	36	0	0
♊	0	♌	0	60	12	57	54	51	52	43	41	34	27	24	51	15	19	6	12		
♉	20	♌	10	57	46	55	34	49	48	41	47	32	40	23	5	13	30	4	18		
♉	10	♌	20	54	51	52	46	47	14	39	27	30	27	20	55	11	18	2	1		
♉	0	♍	0	51	30	49	33	44	16	36	43	27	52	18	24	8	46				
♈	20	♍	10	47	49	46	0	40	58	33	40	25	0	15	36	5	59				
♈	10	♍	20	43	58	43	58	37	28	30	26	21	56	12	39	3	2				
♈	0	♎	0	40	0	38	23	33	50	27	43	18	45	9	35						
♓	20	♎	10	36	2	34	30	30	9	23	36	15	31	6	29						
♓	10	♎	20	32	11	30	43	26	34	20	15	12	22	3	29						
♓	0	♏	0	28	30	27	8	23	9	17	2	9	21	0	36						
♒	20	♏	10	25	9	23	50	20	0	14	5	6	35								
♒	10	♏	20	22	14	20	58	17	15	11	30	4	10								
♒	0	♐	0	19	49	18	34	14	59	9	21	2	9								
♍	20	♐	10	18	0	16	48	13	17	7	45	0	40								
♍	10	♐	20	16	53	15	42	12	14	6	46										
♍	0	♐	30	16	30	15	19	11	52	6	25										

A Table of the Suns Amplitude, in the beginning of each Signe, calculated for the elevation of the Pole 50d. 52d. 54d. & 56d.

Elevation of the Pole.		50			52			54			56		
The Signes		D	′	″	D	′	″	D	′	″	D	′	″
♋		38	20	29	40	22	2	42	43	5	45	29	11
♌	♊	32	29	31	34	6	55	35	58	34	38	8	1
♍	♉	18	4	7	18	53	40	19	49	37	20	53	14
♎	♈												
♏	♓	18	4	7	18	53	40	19	49	37	20	53	14
♐	♒	32	29	31	34	6	55	35	58	34	38	8	1
♑	♍	38	20	29	40	22	2	42	43	5	45	29	11

A Table of the Suns Altitude for every houre, *for the Latitude of* 52^{d}. 30′.

Before noon				12		11		10		9		8		7		6		5		4	
After noon						1		2		3		4		5		6		7		8	
S	D	S	D	D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M
♋	0	♋	0	61	0	58	50	53	7	45	20	36	33	27	27	18	27	9	55	2	9
	20		10	60	39	58	30	52	49	45	3	36	17	27	11	18	10	9	37	1	50
	10		20	59	32	57	26	51	50	44	9	35	36	26	20	17	19	8	43	0	53
♊	0	♌	0	57	43	55	41	50	15	42	42	34	2	24	58	15	55	7	15		
	20		10	55	18	53	22	48	7	40	43	32	9	23	7	14	2	5	18		
	10		20	52	22	50	32	45	29	38	17	29	51	20	51	11	45	2	55		
♉	0	♍	0	49	1	47	17	42	27	35	28	27	10	18	14	9	7		12		
	20		10	45	21	43	42	39	5	32	20	24	12	15	20	6	13				
	10		20	41	28	39	54	35	30	28	58	21	0	12	15	3	9				
♈	0	♎	0	37	30	36	1	31	49	25	30	17	43	9	4						
	20		10	33	32	32	8	28	6	22	0	14	24	5	52						
	10		20	29	39	28	19	24	27	18	33	11	8	2	44						
♓	0	♏	0	25	59	24	42	20	59	15	16	8	2								
	20		10	22	39	21	24	17	49	12	16	5	12								
	10		20	19	42	18	30	15	2	9	38	2	42								
♒	0	♐	0	17	17	16	7	12	44	7	27	0	39								
	20		10	15	28	14	20	11	9	5	49										
	10		20	14	21	13	14	9	57	4	44										
♑	0	♑	0	14	0	12	53	9	36	4	29										

A Table of the Suns Azimuth for every houre, in the beginning of each Signe for the Latitude of 50^{d}.

Before n.		11		10		9		8		7		6		5		4	
After no.		1		2		3		4		5		6		7		8	
Signes		D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M
♋		60	41	37	34	20	23	6	48	4n	48	15	37	26	18	37	24
♌	♊	62	48	40	32	23	23	9	40	2	16	13	17	24	12		
♍	♉	66	59	46	49	30	19	16	15	3s	59	7n	27				
♎	♈	70	43	52	59	37	27	23	51	11	36						
♏	♓	73	26	57	48	43	33	30	40	18	45						
♐	♒	75	9	60	56	47	43	35	34								
♑		75	45	62	3	49	14										

A

A Table of the Suns Altitude for every houre, *for the Latitude of* 52 *degrees.*

Before noon	12		11		10		9		8		7		6		5		4	
After noon.	12		1		2		3		4		5		6		7		8	
S D	S	D	D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M
♊ 30	♋	0	61	30	59	55	53	24	45	29	36	36	27	23	18	17	9	39	1	48
♊ 20	♋	10	61	7	58	53	53	5	45	11	36	18	27	6	18	0	9	21	1	29
♊ 10	♋	20	60	0	57	50	52	7	44	18	35	28	26	16	17	9	8	27	0	32
♊ 0	♌	0	58	12	56	6	50	33	42	52	34	6	24	55	15	46	7	1		
♉ 20	♌	10	55	47	53	47	48	25	40	54	32	14	23	5	13	54	5	5		
♉ 10	♌	20	52	52	50	58	45	49	38	30	29	57	20	50	11	38	2	44		
♉ 0	♍	0	49	31	47	43	42	48	35	42	27	18	18	15	9	2	0	3		
♈ 20	♍	10	45	51	44	9	39	27	32	35	24	20	15	22	6	9				
♈ 10	♍	20	42	0	40	23	35	54	29	16	21	12	12	20	3	8				
♈ 0	♎	0	38	0	36	29	32	13	25	48	17	56	9	10						
♓ 20	♎	10	34	2	32	36	28	31	22	19	14	38	6	0						
♓ 10	♎	20	30	11	28	49	24	54	18	55	11	24	2	54						
♓ 0	♏	0	26	30	25	12	21	27	15	39	8	19								
♒ 20	♏	10	23	9	21	55	18	17	12	39	5	30								
♒ 10	♏	20	22	14	19	2	15	31	10	2	3	2								
♒ 0	♐	0	17	49	16	38	13	14	7	52	0	59								
♑ 20	♐	10	16	0	14	52	11	31	6	15										
♑ 10	♐	20	14	53	13	46	10	28	5	15										
♑ 0	♐	30	14	30	13	23	10	6	4	54										

A Table of the Suns Azimuth for every houre, *for the Latitude of* 52^{d}.

Before noon	11		10		9		8		7		6		5		4	
After noon	1		2		3		4		5		6		7		8	
The Signes,	D	M	D	M	D	M	D	M	D	M	D	M	D	M	D	M
♋	62	21	39	43	22	19	8	s 18	3	n 46	14	58	26	0	37	22
♌ ♊	64	11	42	23	25	6	10	58	1	n 16	12	44	24	0		
♍ ♉	67	52	48	6	31	26	17	14	4	s 39	7	n 7	18	49		
♎ ♈	71	13	53	46	38	15	24	28	11	55						
♏ ♓	73	43	58	14	43	59	30	56								
♐ ♒	75	19	61	10	47	56	35	36								
♑	75	52	62	14	49	23										

A Table of the Suns Altitude for every houre, *for the Latitude of* 54d.

Before noon / After noon	12	11 / 1	10 / 2	9 / 3	8 / 4	7 / 5	6 / 6	5 / 7	4 / 8
S D	S D	D M	D M	D M	D M	D M	D M	D M	D M
♑ 0	♋ 0	59 30	57 28	52 6	44 42	36 17	27 30	18 48	10 31	3 1
20	10	59 7	57 6	51 46	44 23	35 59	27 12	18 30	10 13	2 41
10	20	58 0	56 2	50 47	43 29	35 7	26 20	17 37	9 18	1 43
♒ 0	♌ 0	56 12	54 18	49 11	42 0	33 42	24 57	16 12	7 49	0 11
20	10	53 46	51 57	47 0	39 59	31 46	23 3	14 17	5 50	
10	20	50 51	49 6	44 22	37 30	29 25	20 45	11 57	3 27	
♉ 0	♍ 0	47 30	45 51	41 18	34 38	26 41	18 4	9 16	0 41	
20	10	43 49	42 16	37 54	31 27	23 39	15 7	6 19		
10	20	39 58	38 29	34 19	28 4	20 26	11 59	3 12		
♈ 0	♎ 0	36 0	34 36	30 36	24 34	17 5	8 45			
20	10	32 2	30 42	26 52	22 1	13 43	5 30			
10	20	28 11	26 54	23 13	17 34	10 26	2 26			
♓ 0	♏ 0	24 31	23 17	19 45	14 15	7 18				
20	10	21 9	19 59	16 33	11 13	4 55				
10	20	18 14	17 6	13 47	8 35	1 24				
♒ 0	♐ 0	15 49	14 43	11 28	6 23					
20	10	14 0	12 55	9 45	4 45					
10	20	12 53	11 49	8 42	3 44					
♑ 0	♑ 0	12 30	11 27	8 19	3 23					

A Table of the Suns Azimuth for every houre, in the beginning of each Signe for the Latitude of 54d.

Before n. / After no.	11 / 1	10 / 2	9 / 3	8 / 4	7 / 5	6 / 6	5 / 7	4 / 8
Signes	D M	D M	D M	D M	D M	D M	D M	D M
♋	63 49	41 42	24 9	9 47	2 ♏ 42	14 19	25 41	37 18
♌ ♊	65 24	44 6	26 44	12 17	0 1	12 10	23 46	35 37
♍ ♉	68 39	49 17	32 38	18 13	5 ♐ 20	6 ♏ 49	18 47	
♎ ♈	71 40	54 29	38 58	25 2	12 14			
♏ ♓	73 58	58 38	44 22	31 10				
♐ ♒	75 27	61 23	48 6					
♑	75 59	62 23	49 29					

These

These Tables of the Suns Altitude for severall Latitudes, are calculated to finde the houre of the day, having the altitude of the Sun given, which we have shewed how to attaine in *Chap.* 3. of this Part. But because a Quadrant is not alwaies at hand, we will shew you how by the help of the Canon of Logarithmes, you may finde the Suns altitude with a walking staffe, or Ruler, divided into any number of equall parts, which is thus, *viz.* If you adde the Logarithme of the number of the parts, into which the Staffe or Ruler is divided, unto the Tangent of 45 degrees, and from that summe substract the Logarithme of the number of the parts of the shadow of the staffe, the remainder shall be the altitude of the Sunne.

EXAMPLE. Suppose a Ruler or Staffe, divided into 12 equall parts, being erected parallel to the Horizon, should cast his shadow 11 parts of the Staffe, then say,

As the Logarithme of 11, the parts of the shadow,	1,041393
is to the Logarithme of 12 the length of the Staffe	1,079181
So is the Tangent of 45 degrees,	10,000000
Aggregate,	11,079181
To the Tangent of altitude $47^d, 31'$,	10,037788

Which $47^d\ 31'$, is the true height of the Sun above the Horizon. By the converse of this Example, & the precedent Tables, you may make other Tables to find the hour of the day by the shadow of a Staffe, &c. Though in this Book there be much use of the Tables of Sines, Tangents, and Logarithmes, yet we have omitted the inserting of them, because they are so frequent, and are to be had at a small price.

☞ *Of the Excellent use of the Precedent Tables.*

1 BY the Tables of the Sunnes Altitude may bee made the Quadrants, and Ring Dials, and other Instrumentall and fixed Dials, that give the houre of the day, by the altitude of the Sunne.

2 The Table of the Suns Amplitude is of excellent use to find thereby the variation of the Compasse at Sea, after this manner.

Suppose the circumference of the Card of the Compasse to be divided into 360 degrees, and the North point of the Needle to be placed directly under the Flower-deluce, then observe at Sun rising or setting, how many degrees the Sun is from the East or West, which number of degrees, if they agree with the Amplitude, the Compasse hath no variation, but if they differ, so much is the variation.

3 The Tables of the Suns Azimuth are of excellent use to finde, as before, a Meridian Line, the variation of the Compasse, the

coaſting of a Countrey: Alſo the Quadrants, Cilenders, and ring Dials, that give the houre and Azimuth at the ſame obſervation, are made by helpe of theſe Tables.

4 By the firſt *Chapter* of this Part, you are taught how to find the Declination of the Sun, and by help of that, and the Latitude of your place, you may finde the Meridian altitude of the Sun, every day in Yeare.

To finde the Meridian altitude of the Sun, any day in the yeare, you muſt conſider whether the Decliuation be Northward or Southward, and then proceed thus.

If the Latitude of the place, and Declination of the Sun be both Northward, you muſt adde the complement of the Latitude to the Declination of the Sun, and the ſumme thereof will be the Meridian altitude; But if the Latitude and Declination be unlike, you muſt ſubſtract the Declination from the Complement of the Latitude and the remainder will be the Meridian Altitude.

We might here inſert the projection and making of divers Inſtruments for finding the houre of the Day, the Azimuth, Amplitude, Declination, right Aſcenſion of the Sun, &c. but conſidering how tedious their Demonſtrations would be, wee reſerve them till a more convenient time.

CHAP. V.

Of the Twilight, and how to finde the quantity thereof by a Table.

CRepuſculum, or Twilight, ſeemes to come, *à luce crepera, ſeu dubia*, becauſe the light is doubtfull, and begins to appeare in the morning, by the acceſſe of the light of the Sun, and diffuſed orbicular reflection of his beams; and in the Evening it ends by the receſſe of the Suns light from the Weſt Horizon: For the ayre, aſwell before the riſing of the Sun, as after his ſetting is a little bright, but ſcarſe perceptable. Nevertheleſſe the ſpace of time comprehended from the firſt appearance of the Sun beames, unto the compleat riſing of the Sun, and from the ſetting of the Sun, unto the obſcure comming of darkneſſe, is to be accounted part of the artificiall night, the one called *Crepuſculum matutinum*, the other, *Crepuſculum veſpertinum*. *The Crepuſculum matutinum*, or morning twilight, begins when the Sunne is within 18 degrees of the Horizon, and the *Crepuſculum veſpertinum*, or evening twilight, ends when the Sun is 18 degrees under the Horizon, for you are to note, that Aſtronomers account it not night, till the Sun be 18 degrees below the Horizon, and

and therefore we may conclude it to be continuall day from the 12 of *May* to the 12 of *July*, in all which time, the Sunne descendeth not so low under our Horizon in the Meridian of *London*.

A Table shewing the quantity of Twilight, any time of the Yeare.

The place of the Sun.	The Elevation of the Pole.											
	46		48		50		52		54		56	
	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.	H.	M.
♉	2	36			*All Twilight.*							
♊ ♌	2	23	2	35								
♋ ♍	1	58	2	1	2	8	2	17	2	37	2	55
♈ ♎	1	43	1	45	1	49	1	54	2	1	2	9
♓ ♏	1	43	1	46	1	50	1	55	2	2	2	8
♒ ♐	1	48	1	53	1	59	2	6	2	14	2	22
♑	1	55	2	2	2	7	2	13	2	19	2	27

Now if you would find the quantity of Twilight by the former Table, doe thus; Seeke the Signe that the Sunne is in, on the left hand of the Table, and the elevation of the Pole on the head, and in the place of meeting you shall have the just quantity of Twilight, that is to say, how long the day is dawning before the rising of the Sun, and how long it is before Twilight ends, after the going downe of the Sun; for better explanation observe this Example following.

EXAMPLE. When the Sun enters the first point of ♉ or ♍ you desire to know how long day breaks before Sun rising, and how long day light ends after the Suns setting. Therefore cast your eye upon the Suns place, and proceed directly forward, till you come under the Latitude of 52 degrees, and there you find 2 houres 17 minutes, which is the time the day breakes before Sun rise, and also the time that Twilight ends after Sun set.

CHAP.

CHAP. VI.

Of the Longitude, Latitude, right Ascension, Declination, and Semidiurnall Arches, of the most notable fixed Stars.

The Use of the first following Table.

THis Table needeth little explanation, for having found the name of the Star in the first columne, in the second, you shall have the Longitude, or place thereof: in the third, the Latitude or distance from the Ecliptique line, and in the fourth and last columne, of what degree of magnitude it is of: Of all which, the ingenious may make excellent good use. This needeth no example.

A Table shewing the true Longitude, Latitude, and Magnitude, of some of the most notable Stars in each Constellation: calculated for the year 1647, according to the exquisite observations of *Tycho Brahe*.

The names of the Stars.	Longitude, or place.			Latitude.			Magni.
	S	D	M	D	M		
The right shoulder of Cepheus	♈	7	52	68	54	♑	3
Head of Andromeda	♈	9	29	25	42	♑	2
The first ✶ of Aries	♈	28	16	7	9	♑	4
Girdle of Andromeda	♈	25	28	25	59	♑	2
Girdle of Cepheus	♉	0	52	71	7	♑	3
The So: foot of Andromeda	♉	9	18	27	47	♑	2
Head of Medusa	♉	21	16	22	22	♑	3
The brightest of the 7 Stars	♉	25	3	4	0	♑	3
Aldeboran, the Buls eye	♊	4	52	5	31	♋	1
Alhaior, the Goat	♊	16	55	22	52	♑	2
The Pole Star	♊	23	42	66	2	♑	2
Right shoulder of Auriga	♊	26	31	21	28	♑	2
Syrius, the greater Dog	♋	9	15	39	30	♋	1
Castor, Apollo	♋	15	20	10	2	♑	2
Prorvon the lesser Dog	♋	20	58	15	57	♋	2

The names of the Stars.	Longitude, or place. S	D	M	Latitude. D	M		Magni.
Pollux, Hercules	♋	18	22	6	38	♑	2
The North Aselli	♌	2	36	3	8	♑	4
The South Aselli	♌	3	47	0	4	♐	4
Hart of Hydra	♌	22	25	22	24	♐	1
Regulus, the Lyons heart	♌	24	56	0	27	♑	1
Root of the Great Bears tail	♍	3	51	54	25	♑	2
Left shoulder of Bootes	♎	13	45	49	34	♑	3
Arista, The Virgins-spick	♎	18	56	1	59	♐	1
Arcturus	♎	19	19	31	3	♑	1
Lucida Corona	♏	7	18	44	23	♑	2
South Ballance	♏	10	10	0	26	♑	2
North Ballance	♏	14	28	8	35	♑	2
Lucida Colli Serpentis	♏	17	9	25	36	♑	2
Right shoulder of Hero	♏	26	7	42	48	♑	3
Left hand of Ophiuchus	♏	27	24	17	19	♑	3
Left knee of Ophiuchus	♐	4	18	11	30	♑	3
Antares, the Scorpions Heart	♐	4	52	4	27	♓	1
Left Shoulder of Hercules	♐	9	49	47	47	♑	3
Head of Hercules	♐	11	10	37	23	♑	3
Head of Ophiuchus	♐	17	29	35	57	♑	3
Right shoulder of Ophiuchus	♐	20	24	28	1	♑	3
Bright * of the Dragons H.	♐	23	3	75	3	♑	3
Bright * of Lyra	♑	10	22	61	47	♑	1
Taile of the Vulture	♑	14	55	36	16	♑	3
Swans nose	♑	26	23	49	2	♑	3
Bright * of the Vulture	♑	26	48	29	21	♑	2
The higher wing of ♄ Swan	♒	11	32	64	28	♑	3
Left shoulder of ♒	♒	18	30	8	42	♑	3
Brest of the Swan	♒	20	4	57	10	♑	3
Lower wing of Swan	♒	21	48	49	26	♑	3
The Mouth of Pegasus	♒	27	1	22	7	♑	3
Right shoulder of ♒	♒	28	28	10	42	♑	3
Fomahant	♒	28	50	21	0	♐	1
The taile of the Swan	♓	0	27	59	56	♑	2
Marchab	♓	18	35	19	26	♑	2
Scheat	♓	24	28	31	8	♑	2
Whales tail, Boreall	♓	26	2	10	1	♐	3
Whales tail Aust.	♓	27	35	20	47	♐	2

An Explanation of the second Table.

THis Table consisting of foure Columnes, in operation, differeth nothing from the former, for having found the name of the Star in the first columne towards the left hand, in the second you shall have his Right Ascension: in the third, his Declination: and in the fourth, his Semediurnall arch, or halfe continuance above the Horizon.

EXAMPLE. **The Buls Eye**, hath right Ascension 4 hours, 16 minutes, Declination 15 degrees 45 min. **Boreal** (or North) and that the Semediurnall arch is 7 hou. 26 min. which doubled, is 14 hou. 52 min. the time that the said star continueth above the Horizon.

The second Table, shewing the right Ascension, Declination, and Semidiurnall Arches, of some of the principall fixed Stars, calculated for the year 1647, and will serve without sensible errour, for some ensuing Yeares.

The names of the Stars	Right Ascension. H	M	Declination D	M		Semidi-Arch. H	M
The Pole Star	0	32	87	29	♑	Set not	
The Lions tail, Boreall	1	44	10	48			
Bright ✶ of ♈	1	48	21	47	♑	8	5
Head of Medusa	2	46	39	33	♉	Set not	
The brightest of the 7 Stars	3	27	22	58	♑	8	13
Aldebaran, the Buls eye	4	16	15	45	♑	7	26
The Goat	4	51	45	34	♑	Set not	
Right shoulder of Auriga	5	34	44	52	♑	Set not	
Syrius, the greater Dog	6	30	16	13	♊	4	31
Procyon, the lesser Dog	7	21	6	7	♑	6	32
Precepe	8	21	20	54	♑	7	58
The North Aselli	8	22	22	42	♑	8	11
The South Aselli	8	24	19	26	♑	7	48
Heart of Hydra	9	11	7	8	♌	4	22
Busiliscus, the Lyons heart	9	50	13	41	♑	7	13
The tail of ♌	11	31	16	34	♑	7	31

The

The names of the Stars	Right Ascensi. H	M	Declination D	M		Semidiurnall ar. H	M
The girdle of ♍	12	39	5	22	♑	6	28
Vindemiatrix ♍	12	45	12	53	♑	7	9
The Virgins Spicke	13	7	9	16	♐	5	11
Arcturus	14	0	21	6	♑	8	0
South Ballance	14	32	14	30	♐	7	18
North Ballance	14	58	8	1	♐	5	18
Lucida Coronæ	15	30	27	57	♑		
Antares, the Scorpions Heart	16	8	25	33	♐	3	27
Right shoulder of Hercules.	16	15	22	20	♑	8	8
Head of Hercules	16	59	14	51	♑	7	20
Left Shoulder of Hercules	17	0	25	18	♑	8	32
Bright * of the Dragons he.	17	49	51	36	♑	Set not.	
Bright * of Lyra	18	25	38	30	♑	Set not,	
Aultures taile	18	50	13	24	♑	7	12
Swans taile	19	17	27	15	♑	8	49
Bright * of the Aulture	19	34	44	18	♑	Set not	
The higher wing of ♀ Swan	19	35	44	18	♑	Set not	
Brest of the Swan	20	19	39	9	♑	Set not	
The taile of the Swan	20	30	44	2	♑	Set not	
The Girdle of Cepheus	21	24	69	1	♑	Set not	
The Mouth of Pegasus	21	27	8	17	♑	6	43
Formahant	22	38	31	25	♐	3	32
Scheat	22	47	26	10	♑	8	39
Marchab Pegasi	22	48	13	19	♑	7	12
Head of of Andromeda	23	50	27	9	♑	8	48
The Girdle of Andromeda	24	50	33	47	♑	10	2

An explanation of the following Table.

HAving any point of the Ecliptick given, you may get the Right Ascension thereof, if you enter the said Table of Right Ascensions, finding the Signe on the head of the Table, and the degree in the first columne on the left hand, for so shall you obtain your desire.

To finde the Suns Right Ascension.

SEek the place of the Sun in Signes and Degrees (which may serve well enough for our present purpose) then come to this Table, and finde the character of the Signe of the Suns place in the

head of the Table, and the deg. in the first columne on the left hand, and in the place of meeting, you have the Suns right ascension in houres and minutes.

To finde at what time any of the fixed Stars (expressed in the second Table) come to the South.

HAving now shewed you how to finde the Right Ascension of the Sun and fixed Stars, you may thereby know speedily when they will culminate, or come to the South point, thus. Deduct the right ascension of the Sun from the right Ascension of the Star, and the residue wil shew the time of the culmination of the said Star, as for example.

The 11th. of *December*, it is required to know at what time the bright Star called *Aldebaran*, will be due South, therefore according to the aforegoing instructions, finde the Right Ascension of *Aldebaran*, to be 4 houres, 16 minutes, and the Right Ascension of 0 ♑ (which is the place of the Sun that day) to be 18 houres, 0 min. Now because Substraction cannot be made conveniently, in regard the Suns Right Ascension is most, therefore adde 24 houres to the Right Ascension of *Aldebaran*, and the aggregate is 28 hou. 16 min. out of which taking the Suns Right Ascension 18 houres, there remains 10 hou. 16 min. the time that *Aldebaran* comes to the South after the Sun, so that at 10 of the clock and 16 min. at night I conclude *Aldebaran* is due South.

Now that you may know when the said Star riseth, deduct the Semidiurnall arch 7 hou. 26 min. out of 10 hou. 16. min. (the time of the culmination of the said star) and the remainder is 2 hou. 50 min. which sheweth the Star *Aldebaran* riseth at 50 min. past two in the afternoon.

And that you may know also when it sets adde the said semidiurnall arch 7 hou. 26 min. to the time of the culmination, *viz.* 10 hou. 16 min. and the aggregate is 17 hou. 42 min. from whence taking 12, there remains 5 hou. 42 min. the time of the said Stars setting *December* 11 in the morning.

A

A Table ſhewing the right Aſcenſion of all the points of the Ecliptique, being very uſefull to finde the ſouthing of the Planets and fixed Stars.

Degr.	♈ H	M	♉ H	M	♊ H	M	♋ H	M	♌ H	M	♍ H	M	♎ H	M	♏ H	M	♐ H	M	♑ H	M	♒ H	M	♓ H	M
1	0	4	0	55	3	55	6	4	8	13	10	12	12	4	13	55	15	55	18	4	20	13	22	12
2	0	7	0	59	4	0	6	9	8	17	10	16	12	7	13	59	16	0	18	9	20	17	22	16
3	0	11	1	3	4	4	6	13	8	21	10	20	12	11	14	3	16	4	18	13	20	21	22	20
4	0	15	1	7	4	8	6	17	8	25	10	24	12	15	14	7	16	8	18	17	20	25	22	24
5	0	18	1	11	4	12	6	22	8	29	10	27	12	18	14	11	16	12	18	22	20	29	22	27
6	0	22	1	15	4	16	6	26	8	34	10	31	12	22	14	15	16	16	18	26	20	34	22	31
7	0	26	1	19	4	21	6	30	8	38	10	35	12	26	14	19	16	21	18	30	20	38	22	35
8	0	29	1	23	4	25	6	35	8	42	10	39	12	29	14	23	16	25	18	35	20	42	22	39
9	0	33	1	26	4	29	6	39	8	46	10	42	12	33	14	26	16	29	14	39	20	46	22	42
10	0	37	1	30	4	33	6	44	8	50	10	46	12	37	14	30	16	33	18	44	20	50	22	46
11	0	40	1	34	4	38	6	48	8	54	10	50	12	40	14	34	16	38	18	48	20	54	22	50
12	0	44	1	38	4	42	6	52	8	58	10	54	12	44	14	38	16	42	18	52	20	58	22	54
13	0	48	1	42	4	46	6	56	9	2	10	57	12	48	14	42	16	46	18	56	21	2	22	57
14	0	52	1	46	4	51	7	1	9	6	11	1	12	52	14	46	16	50	19	1	21	6	23	1
15	0	55	1	50	4	55	7	5	9	10	11	5	12	55	14	50	16	55	19	5	21	10	23	5
16	0	59	1	54	4	59	7	9	9	14	11	8	12	58	14	54	16	59	19	9	21	14	23	8
17	1	3	1	58	5	3	7	14	9	18	11	12	13	3	14	58	17	3	19	14	21	18	23	12
18	1	6	2	2	5	8	7	18	9	22	11	16	13	6	15	2	17	8	19	18	21	22	23	16
19	1	10	2	6	5	12	7	22	9	26	11	20	13	10	15	6	17	12	19	22	21	26	23	20
20	1	14	2	10	5	16	7	27	9	30	11	23	13	14	15	10	17	16	19	27	21	30	23	23
21	1	18	2	14	5	21	7	31	9	34	11	27	13	18	11	14	17	21	19	31	21	34	23	27
22	1	21	2	18	5	25	7	35	9	37	11	31	13	21	15	18	17	25	19	35	21	37	23	31
23	1	25	2	22	5	29	7	39	9	41	11	34	13	25	15	22	17	29	19	39	21	41	23	34
24	1	29	2	26	5	34	7	44	9	45	11	38	13	29	15	26	17	34	19	44	21	45	23	38
25	1	33	2	30	5	38	7	48	9	49	11	42	13	33	15	30	17	38	19	48	21	49	23	42
26	1	36	2	34	5	43	7	52	9	53	11	46	13	36	15	35	17	43	19	52	21	53	23	45
27	1	40	2	39	5	47	7	56	9	57	11	49	13	40	15	39	17	47	19	56	21	57	23	49
28	1	44	2	43	5	51	8	0	10	1	11	53	13	44	15	43	17	51	20	0	22	1	23	53
29	1	48	2	47	5	56	8	5	10	5	11	56	13	48	15	47	17	56	20	5	22	5	23	56
30	1	52	2	51	6	0	8	9	10	8	12	0	13	52	15	51	18	0	20	9	22	8	24	0

FINIS.

Omnibus Astronomiæ *per* Magnam Britaniam *cultoribus, & isti prorsus Scientiæ minimè peregrinis, Salutem.*

Viri non mediocritèr periti,

PEr multas ego tabulas, & regulas tum *Astronomicas*, tum *Mathematicas*, huic nostro Libello, in vestrum omnium usum & delectationem annexerim; tales autem in lucem proferre constitui, quales ad utilitatem vulgi (cujus intelligentia in inferiori regione, inter erroris & ignorantiæ nubes locatur) maximè pertinerent; ut igitur veritas latens, aliquantulum appareat, & apparens, magis indies eluceſcat, calimo nunc temporis operam dedi: Vos autem *Astronomica* mea *Progymnasmata* in futurum expectetis, quæ magis (ni fallor) desideriis hominum respondebunt, & politioris lituraturæ Cincinnis fructum paritèr ac voluptatem afferent. In præsens (Lectores benevoli) hoc, in votis habeo, ut paucas has lineas æqui boniqué consulatis, utcunqué enim vobis, vobis inquam artibus excultissimis, vanæ videantur Nugæ, imperitos adhuc animos præceptis imbuant, & ad Emolumentum spectarent, illorum maximè, qui quamvis mellitam *Astronomiæ* dulcedinem sitiant, non minimas istius Scientiæ guttas degustârunt. Sed nimiâ prolixitate, quæ molestiis afficiat, non utar, spem animo nutriens, quòd brevi temporis spatio, accuratius (si vacat) Studiorum inditium ante oculos proponam, indè vos vestri laboris legendo non pœnitebit. *Interim valete,*

Ex Vico *North-Luffenhamiensi* Idibus *Novembris* anno Æræ Christianæ Juliano exunte CIↃ. IC. XLVIII.

Vincentius Wing.

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